HOTEL NETWORK DESIGN

Virtual Cybersecurity Internship 2021 Report

Submitted

To

Centre of Excellence
Cybersecurity & Networking

Duration :Two Months

By

JANVI SINGH

1803231074

ABES ENGINEERING COLLEGE

AKTU

Under the guidance of
Krishna Vir Singh

CERTIFICATE

This is to certify that Project Report entitled “HOTEL NETWORK DESIGN” which is submitted by Janvi Singh in partial fulfillment of the requirement for the summer internship of CISCO in Department of COMPUTER SCIENCE of ABES ENGINEERING COLLEGE, is a record of the candidate own work carried out by him under my/our supervision.

Supervisor

Date

ACKNOWLEDGEMENT

It gives us a great sense of pleasure to present the report of the Project Based Internship 2021 undertaken during CISCO. We owe special debt of gratitude to Krishna Vir Singh, Centre of Excellence : Cybersecurity & Networking for his constant support and guidance throughout the course of our work. His constant motivation have been a constant source of inspiration for us. It is only his cognizant efforts that our endeavors have seen light of the day.

We also take the opportunity to acknowledge the contribution of team members of Centre of Excellence : Cybersecurity & Networking for their full support and assistance during the development of the project.

We also do not like to miss the opportunity to acknowledge the motivation of CSE Department and ABES ENGINEERING COLLEGE to provide us the opportunity to undergo AICTE Virtual Cybersecurity Internship at Centre of Excellence : Cybersecurity & Networking.

Signature:

Name :Janvi Singh

Roll No.:1803231074

Date :28/06/2021

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

1.1 Aim of the Project:

The aim of the project is to provide a highly available and scalable environment for collocation of Internet , Intranet and External services, and applications. The network is planned such that it will provide the necessary backbone connectivity between the different floors to ensure that the network becomes an enabler for business plans.

1.2 Objective of the Project:

The objective of the project is to provide a network which will let various guests of the hotel and their employees connect to the main Server. IT further provides greater speed and reduces time consumption.

1.3 Scope of the Project:

There is a vast scope of this Network. This design can be improved and can be used by various hotels . We can easily implement any changes to the network Design as we are using the latest protocol like Border Gateway Protocol (BPG) in our network which has attributes to easily divert or control the flow of data .

CHAPTER 2

FEASIBILITY STUDY

2.1 Technical Feasibility: There was a medium familiarity with the application and technology. The system developed was outside of anything done before at Cisco**.**The members of the product group had some prior knowledge of Cisco software. The software, however, is complicated and contains many components. Therefore, it took some time for the project team to learn how to use the software to be able to build the system. The team had excellent knowledge of the programming tools and applications used for implementation of the system.This was a medium to large size project. Much analysis was needed for a proper implementation. Development of the system was somewhat complex.The system being developed has good compatibility with the existing systems.

2.2 Financial Feasibility: This project performs a cost/ benefits analysis of the hotel network design and is financially feasible . The complete project is made in a cost effective manner .

2.3 Market Feasibility: All the components used in the project are easily available in the market .Further the project has the ability to withstand the current market scenario .

2.4Social Feasibility: This project lays a well-connected, secure, reliable, dependable communication among different departments. Several departments can simply split the required data without any problem and can exchange their data without going physically to them thus conserving time and energy. Thus the project is financially feasible.

CHAPTER 3

REQUIREMENT ANALYSIS REPORT

3.1 Requirement Gathering:

Area		Needs Assessment Items	Status

Existence Hardware equipment	Manpower	Computer Hardware Engineers	desirable
		Computer Software Engineers	desirable
		System Analysis Engineers	semi desirable
	Equipment	Auxiliaries Equipment	desirable
		Systems (PC, Laptop)	desirable
		Scanner and Printer	desirable
		Support Services	desirable
Existence software equipment		Software for Sending and Receiving Information	desirable
		Support for Data Storage	desirable
		Data Management Tools	desirable
		Support to Integration and Combining Data	desirable
		Software for Quick Access to Records	desirable
Existence Network security		Backup for Security Purposes	desirable

system			

3.2 Requirement Analysis: A Hotel area network is an essential part of the Hotel system. A Hotelnetwork has several uses such as, result publishing, resource sharing, file sharing, communication, etc.The Hotel Area Network design is about designing a topology of a network that is a LAN (Local Area Network) for a Hotel in which various computers of different departments and buildings are Setup so that they can interact and communicate with each other by interchanging data. To design a network for a Hotel, which connects various departments and buildings to each another, it puts forward communication among them. One of the purpose of networking is to reduce isolated users. The systems should be capable of communicating with others and should provide the desired information. A simulation tool offers a way to predict the impact on the network of a hardware upgrade, a change in topology. Therefore, in this dissertation, a HNS network is designed using Cisco Packet Tracer

3.3 Functional Requirements:

User category	**User category**

Customer	The system display room availability and price • The system enable user to input personal information • The system direct user to secure payment method • The system send notification to confirm room reservation • The system enable users to cancel room reservations.
Staff member	The system have an Authentication page with username password. • System have a 'forgot password' option on the authentication page that sends a link to a verified email or phone number to set a different password. •The system enable users to view, edit and add employee information. • The system enable user to view and edit room occupation status • The system enable user

	to view and edit room cleaning status including minbar usage. • The system enable user to process payment using cash register machine.

3.4 Non- Functional Requirements:

Type of Requirement	Specification
Operational Requirements	• The system is able to work on Internet Explorer, Google Chrome, Safari, Opera, Mozilla Firefox, Microsoft Edge, and other web browsers. • The system is able to fully function on smartphones and mobile devices • On-premises devices always have internet connection to allow real-time database updates • The system is able to operate on different operating systems including every generation of Microsoft Windows, Mac, and Linux. • The system is able to connect

	with online payment methods including PayPal and TransferWise. •The system is able to support maintenance within two weeks of notice
Performance Requirements	• Response time for visible pages for customers is less than 5 seconds excluding online payment transactions. • Response time for visible staff members is less than 10 seconds excluding payment transactions. 7 • The system is able to support 500,000 customers in total. • The system is able to support a maximum of 1000 customers simultaneously in peak hours. • The system server is able to handle 1000 requests per second. • The website is able to generate 5000 daily customer interactions. • The system is able to run all times except schedule updates and maintenance. • Maintenance doesnot exceed a maximum of 8 hours in a day and 16 hours in a month.

Security Requirements	• Customers can only view room availability, book room, cancel room and pay for room reservation through secured payment method. • Front desk can only view hotel room status, update room occupation status, update check in and check outs and process payment through cash register. • Housekeeping manager can edit room cleaning status, update housekeeping • Housekeeper can edit room cleaning status and update minibar use. • General manager is able to view and edit all tasks that can be accessed by staff members, can view and update employee information, view and update staff work shifts.
Cultural and Political Requirements	• The system is able to support English language • Currency should be stated in the system as Rupees • Date input in the system should follow date month and year format (DD.MM.YYYY).

CHAPTER 4

4.1 PROJECT INITIATION CHECKLIST

- Is the scope of the project clear? Yes
- Is the project funding approved? No
- Have all the stakeholders been identified?No
- Has a sponsor been identified?No
- Does the project contain 3rd Party or external resources?No
- Have you confirmed in writing the project delivery expectations (time and scope) with all the stakeholders? No
- Have all the project benefits been captured and are reasonable?Yes
- Are you aware of the process of getting the project approved?Yes
- Does the business case cover assumptions, dependencies, and constraints?Yes
- Do you need a risk assessment to be conducted?No
- Will the project costs be capitalized?No
- Do you have a high-level effort estimate for the project?Yes
- Are you supposed to use a standard template for the initiation document?No
- Has the project team been established or resources available to start the project?No

- Does the project need an approved business case to start work?No

4.2 PROJECT PLANNING CHECKLIST

- Have you organized a project kick-off meeting?Yes
- Does the project team need any training?No
- Are you comfortable with the skill level of the project team?Yes
- Do you need a project management plan?Yes
- Do you have enough contingency or buffer in budget and schedule?Yes
- Is there a vendor contract involved in the project?No
- Have all the project components been estimated?Yes
- Do you have a detailed project schedule drafted?No
- Do you need a work breakdown structure?No
- Have you created a baseline for the project plan?Yes
- Is the project team comfortable with the project schedule?Yes
- Do you have clearly defined the milestones for the project?Yes
- How do you plan to track project progress? By checking Regularly
- Have the team leave plans and public holidays been factored into the project plan?No
- Do you have a resource plan for the duration of the project?No
- Do you need to hire additional resources for the project? If yes, has the hiring process been kicked off?No

- Have you factored in the resourcing costs in the plan?No
- Are you aware of the SMEs required for the project?No
- Is your project schedule detailed enough for the project team to understand the tasks?Yes
- Is there a quality assurance plan for the project?Yes

CHAPTER 5
SYSTEM DESIGN

5.1A BRIEF INTRODUCTION OF HOTEL NETWORK DESIGN PROJECT

This project is about designing a topology of a network that is a LAN (Local Area Network) for a Hotel in which various computers of different floors are set up so that they can interact and communicate with each other by interchanging data. To design a networking scenario for a hotel which connects various floors to each other, it puts forward communication among different departments. Hotel Network Design is used to design a systematic and well planned topology, satisfying all the necessities of the Hotel (i.e. client). This project

came up with a network with good performance. It is also providing security and authentication to forbid unauthorized logins.

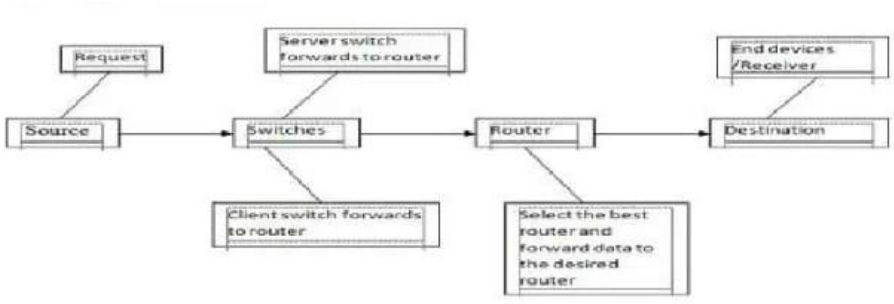
5.2 TECHNOLOGY USED

CCNA: Cisco Certified Network Associate .CCNA is a well-liked certification in computer networking that is developed by Cisco Systems. CCNA was discovered by Cisco, to identify basic capability in installation and maintenance of medium-sized networks.

The technology is used for connecting various devices like routers, switches and different end devices to communicate with each other and interchanging data. To construct a methodical and reliable network, is scalable too. Portability is one of the characteristics of this work application of the CNS.

5.3 WORKING

This Hotel Network Scenario is to provide a well-connected, secure, reliable, dependable communication among different departments. Several departments can simply split the required data without any problem and can exchange their data without going physically to them thus conserving time and energy .This job with respect to the Hotel's Networking Scenario is to provide a systematic, secure,valid, dependable communication among different departments. The work is done keeping in mind the complexity and cost factor.The below figure depicts main components and their components.



5.4 Features

1.This network is based on client-server architecture.

2. Star topology is used here.

3. 4 client switches are present for the four levels of Hotel and they are associated with a server switch.

4. All the departments are categorized into various VLANs, which are connected to the 4 switches based on the sequence in which they are accommodated in the storey.

5. Likewise, various Floors are limited into VLANs and share switches corresponding to their levels.

6. A request is made by any system of any floor and it is forwarded to the client switch which furthermore transmits it to the server.

7. Port-securities are there that are executed on various ports of the switches and give reliability.

8. The data is then transferred to its connected router.

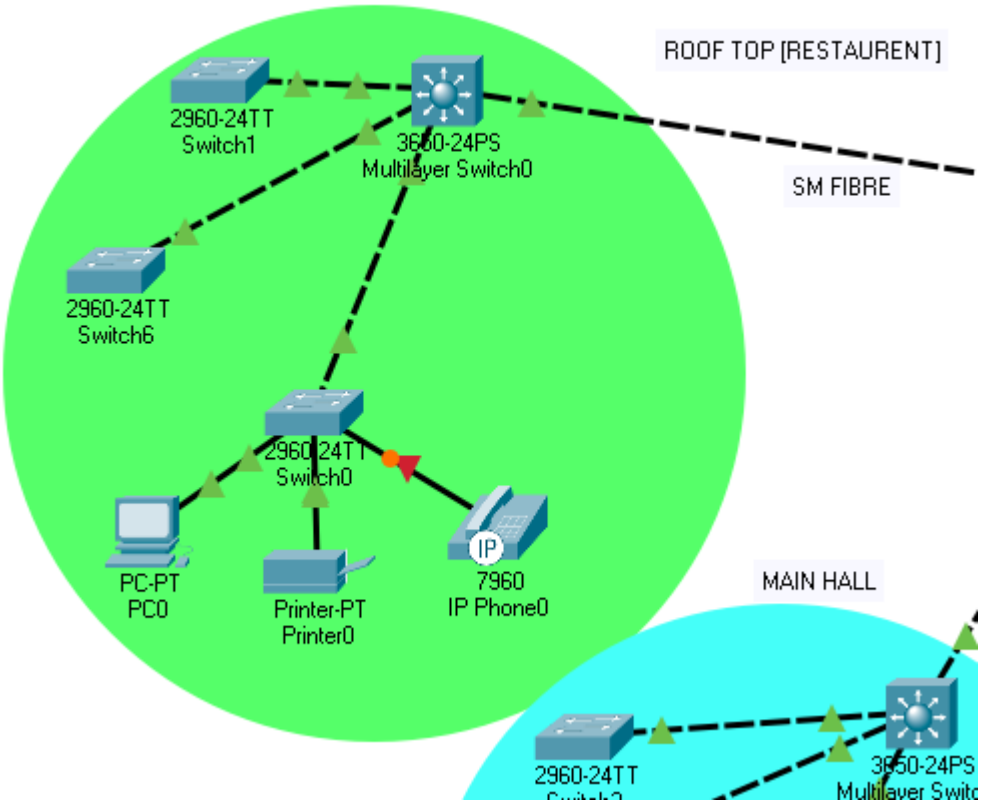
5.5 IP DESCRIPTION OF Hotel Network Design

An IP address is a numerical tag assigned to each device (e.g., computer, printer, etc.) taking part in a computer network that uses the Internet Protocol for any communication. It is a 32-bit number. One is IPv4 and the other is IPv6. IPv4 is of 32 bit and is represented as X.X.X.X i.e. each octet is parted by a dot. For e.g.: 191.157.2.2 .In this project IPv6 is used. The assignment of IP address is reliant upon the number of hosts existing in the network.Depending on the number of hosts present in the hotel; for this network the IP to be used is a class C IP addresses i.e. 196.168.0.0 with a subnet mask of 255.255.0.0. And this IP is then distributed among different VLANs and ports for communication.The larger IP is fragmented into smaller networks

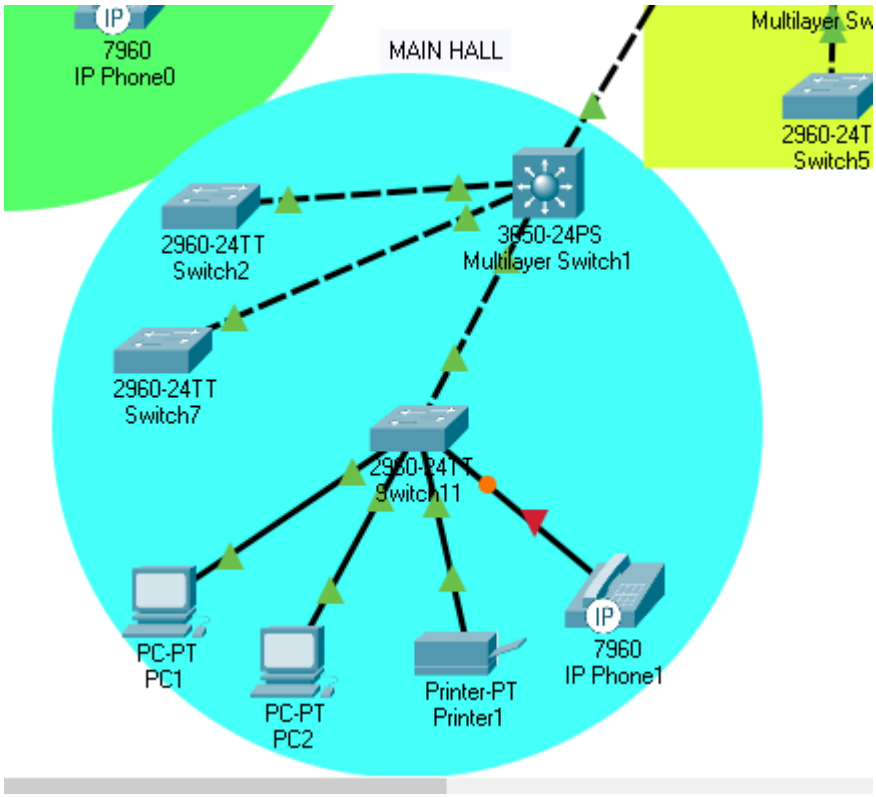
by using the idea of VLSM (Variable Length Subnet Mask).Variable Length Subnet Masking (VLSM) - is a method that permits network administrators to divide an IP address space into subnets of different sizes.VLSM is the breaking down of IP addresses into subnets (multiple levels) and assigning it based on the individual needs on a network.

5.6 DIFFERENT BLOCKS IN THE NETWORK

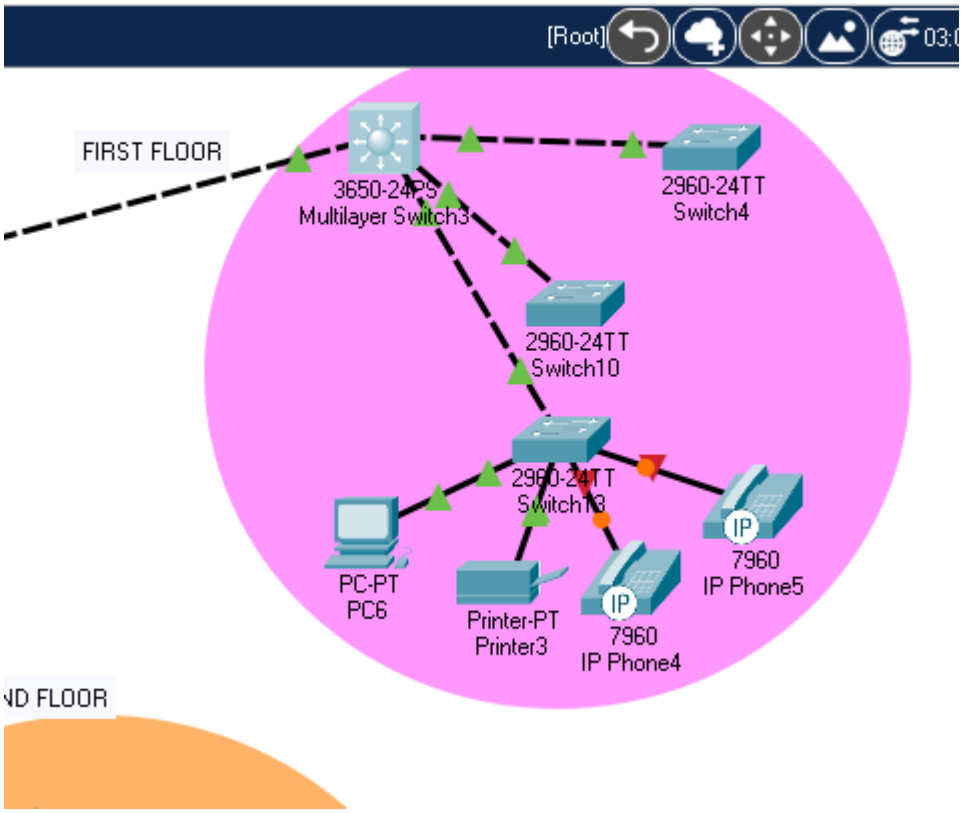
1. **Restaurant At Rooftop:-** The block consists of 1 pc , 1 printer , 1 IP phone , 1 router and three server



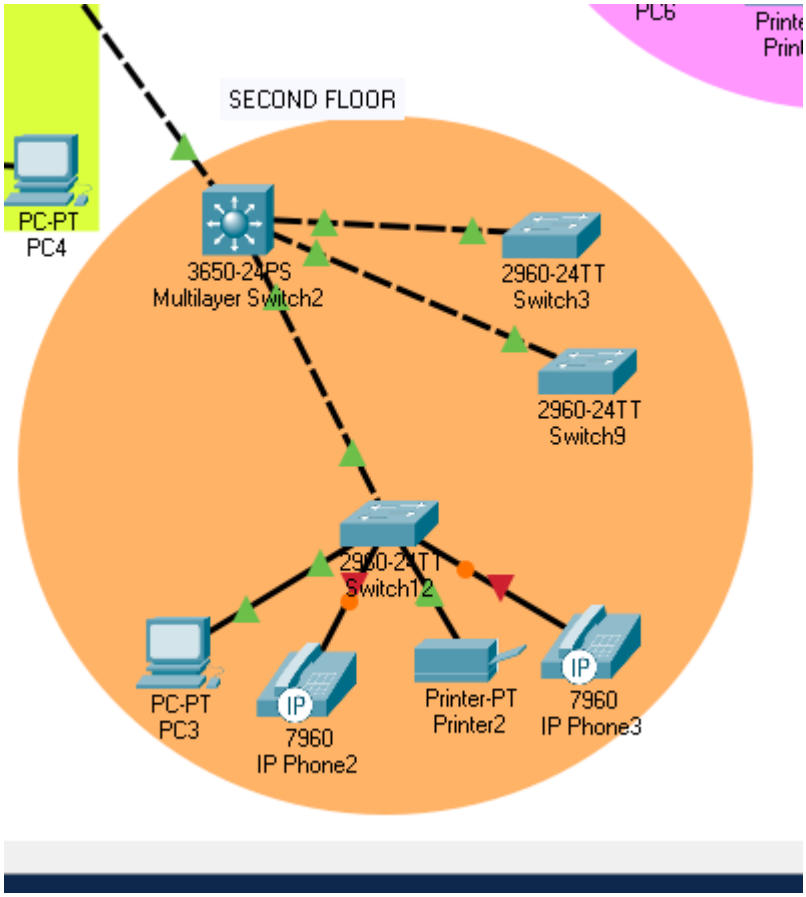
2. **Main Hall:-** The block consists of 2pc , 1 printer , 1 IP phone , 1 router and three server



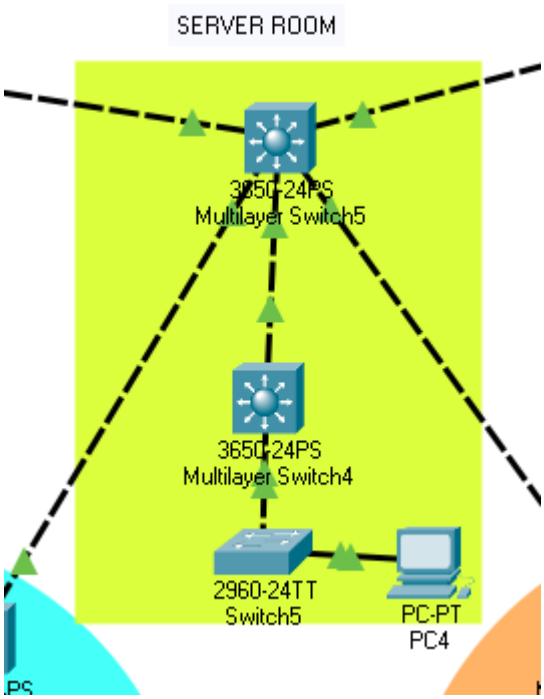
3. **First Floor:-**The block consists of 2 pc , 1 printer , 1 IP phone , 1 router and three server



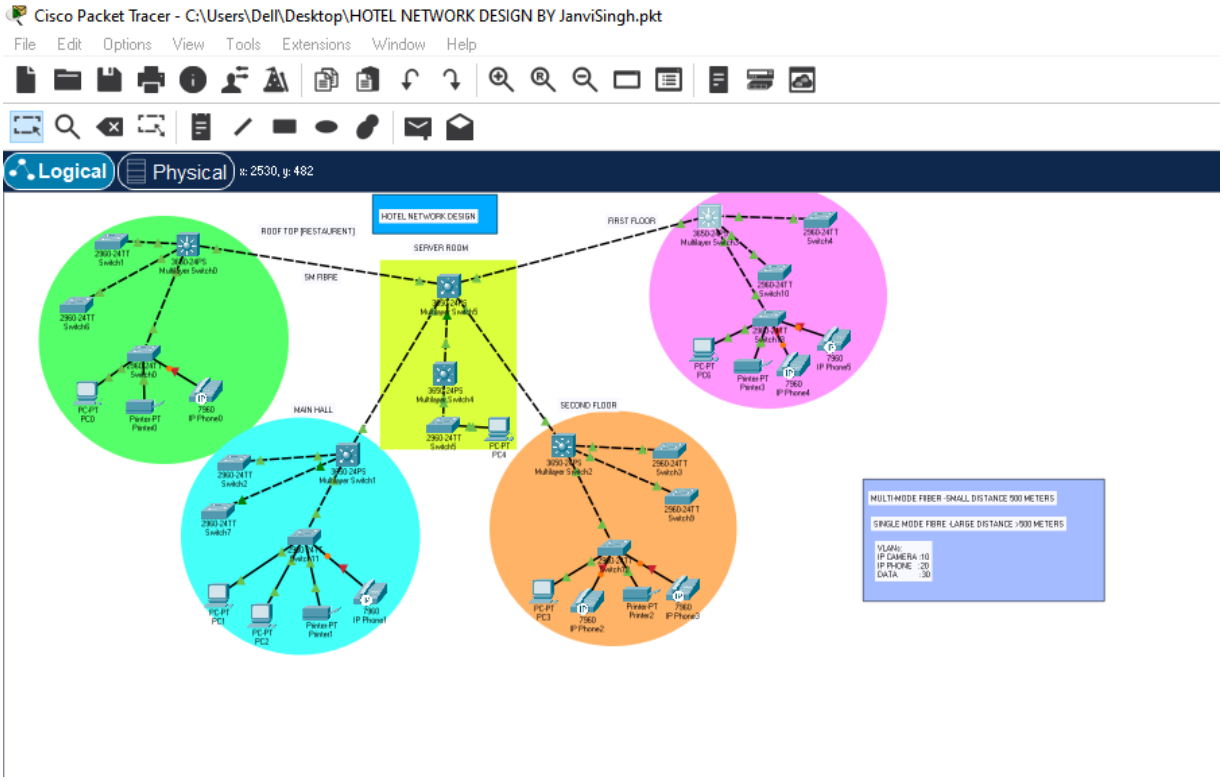
4. **Second Floor:-**The block consists of 2 pc , 1 printer , 1 IP phone , 1 router and three server



5. **Server Room:-**The block consists of 1 pc , 1 router and two server



COMPLETE NETWORK DESIGN



5.7 Operating Environment:

Software used: Packet Tracer

Browser used: Google Chrome System Information:

System Information:

Particulars	**Specifications**
Operating System	Windows
Processor	Intel
Harddisk	500 GB
RAM	8 GB

5.8 Assumptions and Dependencies:

- The hotel staff must have basic knowledge of computers and English language.
- Each User must have a User ID and password.
- There must be an Administrator.
- Internet connection is a must.
- Proper browsers should be installed in the user's system

Chapter -6

IMPLEMENTATION AND RESULTS

6.1Software and Hardware Requirements

Software Requirements:-

The requirements required in the Hotel Network Design are as follows:

Operating System: - Microsoft Windows 7.

Adobe Flash Player.

Cisco Packet Tracer

Hardware Requirements:-

To run the cisco packet simulator, We need some basic requirements, That is given below:-

Random access memory (RAM): 512 MB

Central Processing Unit (CPU): Intel Pentium Dual core.

Storage: 500 MB of free disk space

Display resolution: 800 x 600

Adobe Flash Player

Recommended H/w:

CPU: Intel Pentium III 1.0 GHz

Display resolution: 1024 x 768

Storage: 300 MB free disk space

RAM: > 512 MB

Run the module i.e. for a live project (a network), the hardware requirements are:

5 Switches (Cisco 2950 switch)

1 Router (Cisco 1841 router)

Computer Systems (Generic)

1 Computer system for server

Crossover cable

Straight through cable

6.2 Configuration

In switching there is the main role of VLAN so as to reduce the broadcasting traffic so, for every traffic we create a different VLAN. Different VLAN considered over this network:

Ip Camera: 10

Ip phone: 20

Data: 30

Configuration command done on each switch on network:

```
en
conf t
vlan 10
name IP Camera
vlan 20
name IP Phone
vlan 30
name Data
exit
```

Configuration of Telnet in Switches: Commands:

```
Switch(config)#vlan123
Switch(config-vlan)#name HotelVLAN
Switch(config-vlan)#exit
Switch(config)# interface vlan123
Switch(config-if)# ip address 192.168.123.1 255.255.255.0
Switch(config-if)#exit
Switch(config)#
```

Creation of Password command:

```
line vty 0 15
pass abc
login
exit
enable secret abc
```

Trunking commands: For layer 2 switches:

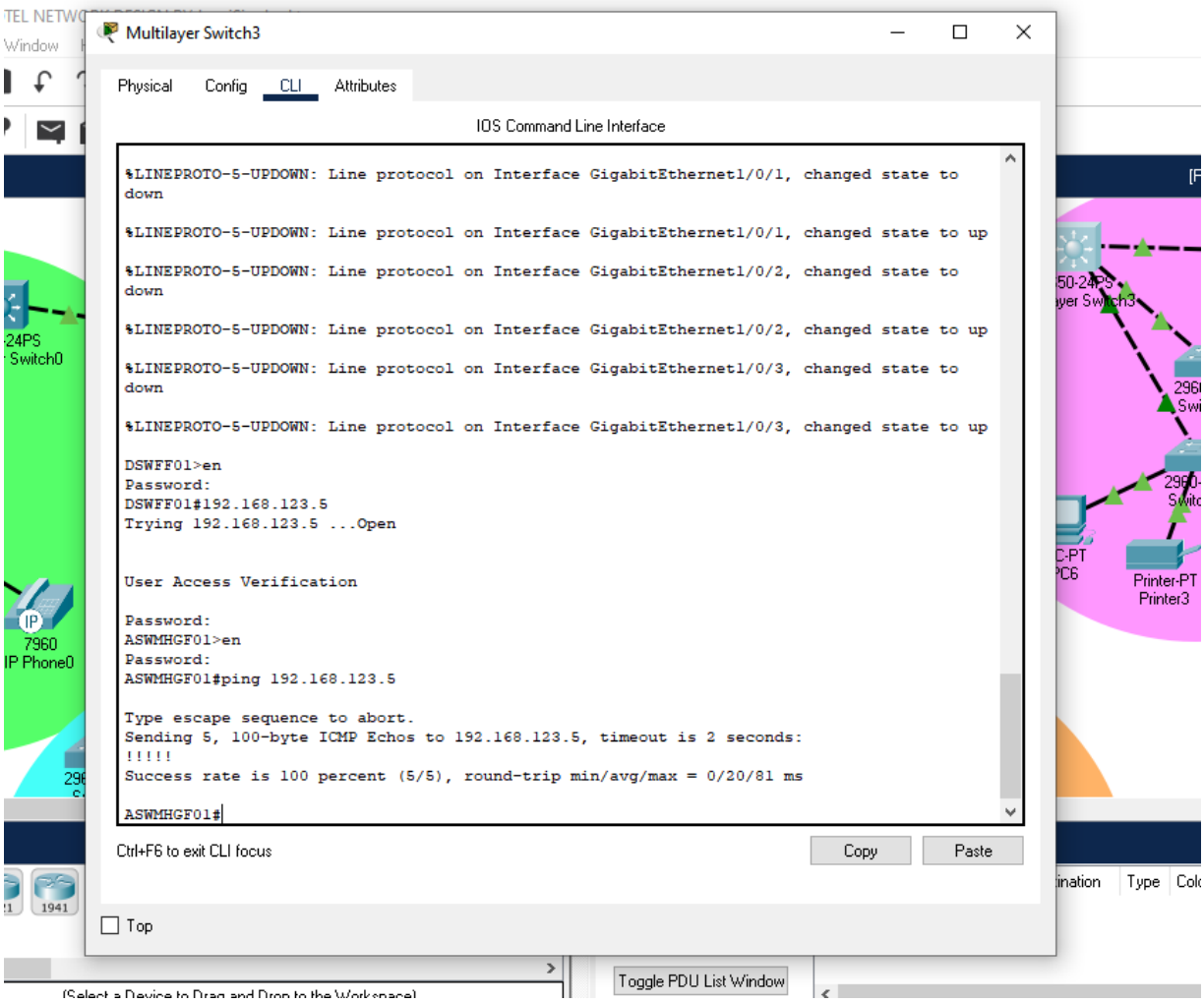
```
int gigabitEthernet 0/1
 Switchport mode trunk
```

For layer 3 switches to change encapsulation type:

```
Switchport mode trunk encapsulation dot1q
Switchport mode trunk
```

6.3 RESULT

Check for ping: Command: ping 192.168.123.5



6.4 CONCLUSION

To Design the network outlook for the community Hotel network design produces the substructure for all other exposure in the service framework such as security of the network, wireless area network,mobility as well as putting the justification to provide safety and security, operational efficiencies,virtual environments, and secure rooms. This paper describes the network design scenario approved by Cisco, as well as where we can apply these scenarios within the various locations of a community Hotel network. Finally, key network foundation services such as switching,

routing, multicast, and high availability are given for the full Hotel network scenario

References

1)Cisco Certified Network Associate Study Guide fifth edition by Todd Lammle

2)http://www.ciscopress.com/articles/article.asp?p=328773&seqNum=3

3)Interconnecting Cisco Devices Part 1 by Cisco

4)Interconnecting Cisco Devices Part 2 by Cisco

5)www.wikiepedia.com

6)Computer Networks-A top-down approach by Kurose and Ross.

7)http://www.cisco.com/en/US/products/hw/routers/ps214/products_tech_note09186a00801f5d85.shtml

8)http://www.symantec.com/connect/forums/sep-client-switch-computer-modeuser-mode-automatically and-moving-other-group

9) http://en.wikipedia.org/wiki/Router_(computing)

10) Introduction to Packet Tracer by Cisco. (Netacad.com).

11) Introduction to Cyber Security by Cisco. (Netacad.com).

12) Introduction to Cyber Security Essentials by Cisco. (Netacad.com).