

KLE Society's
KLE Technological University



Computer Networks-2

Hotel Management Case Study

Under the guidance of
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Submitted By

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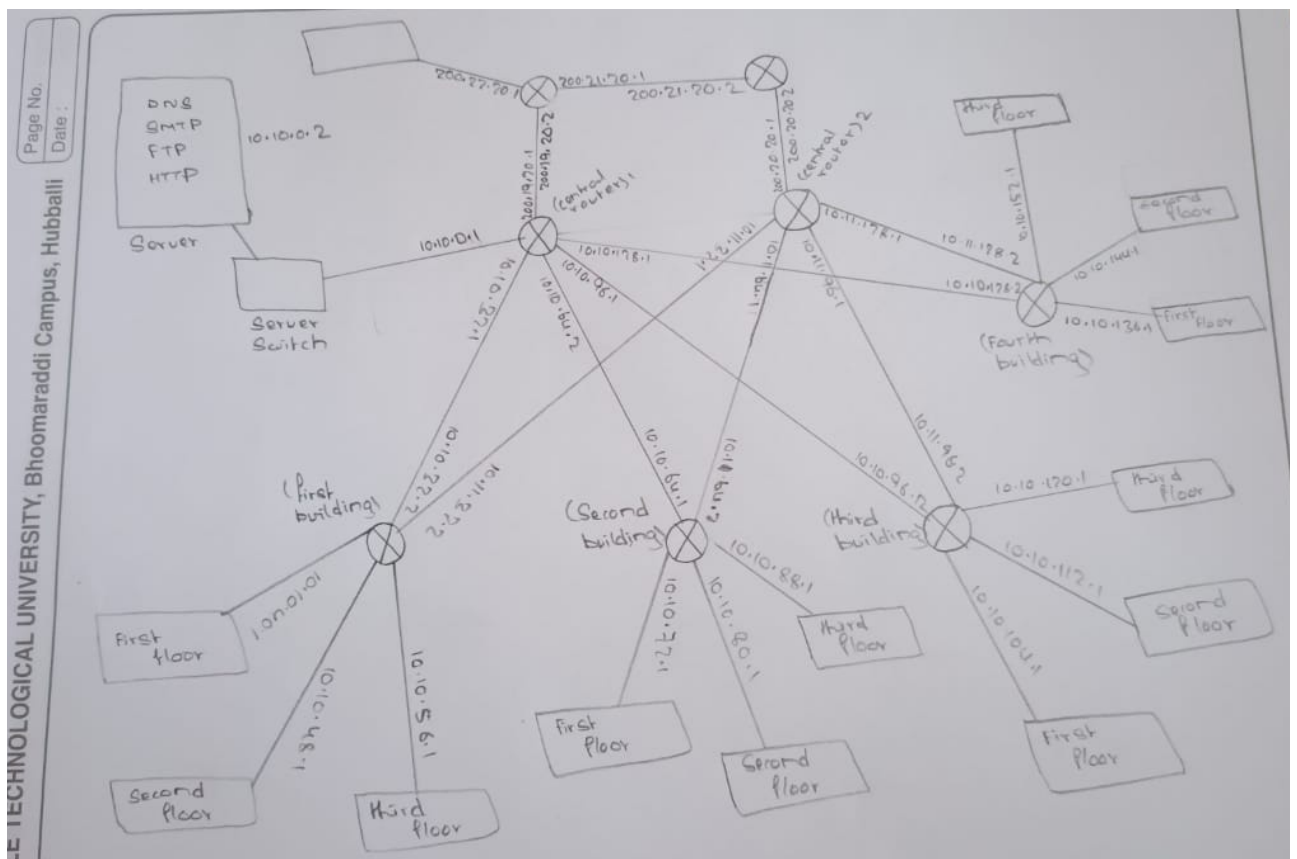
1.Topology

The Case Study Hotel Management.

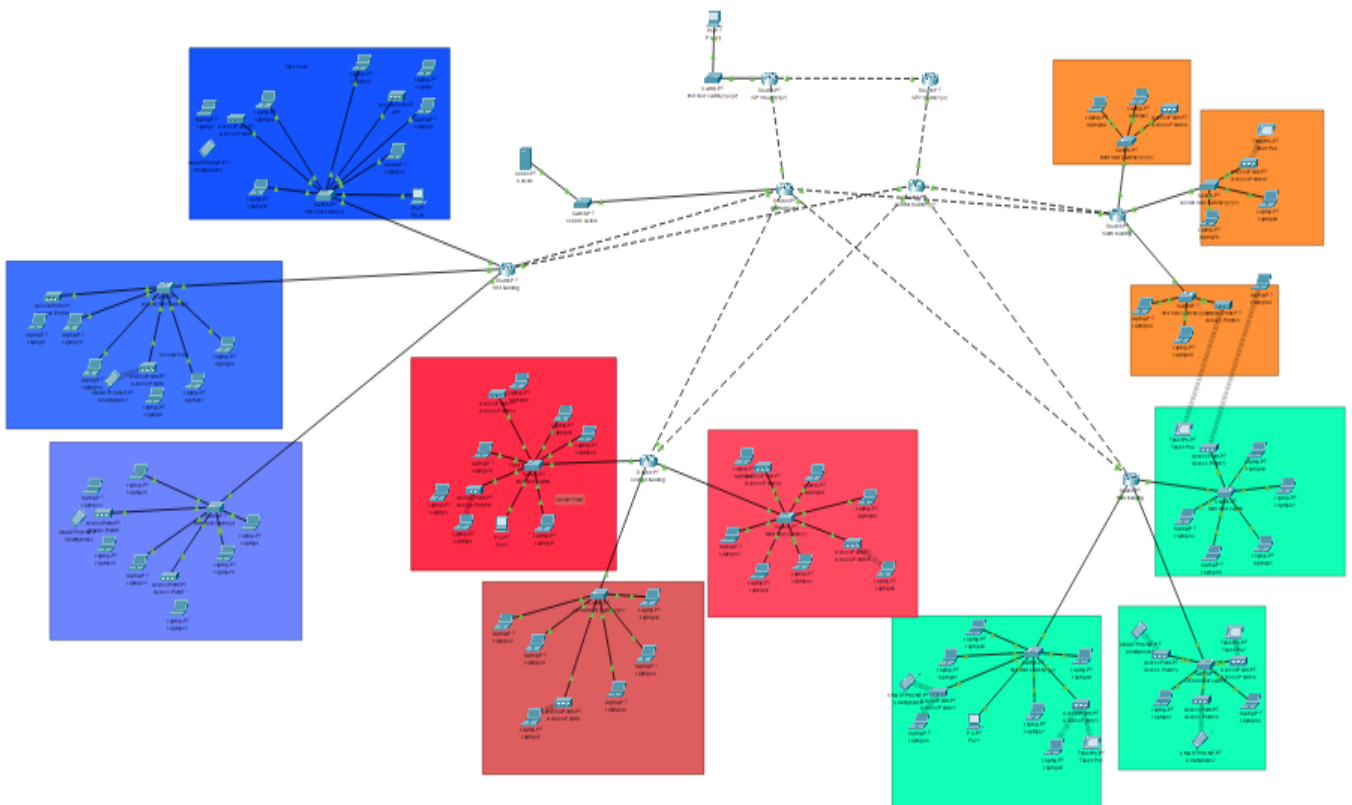
The hotel consists of ,

- 3 buildings.
- Each building has 3 floors.
- Each floor has 20 rooms and 5 wifi access points.
- Each room has 1 Ethernet port.

1.1 Diagram representing the topology.



1.2 Image representing implementation of topology in Cisco Packet Tracer.



2.Ip Scheme

Central router :

CIDR: 19

Possible network: 16

Network	Number of host	Net mask
10.10.0.0	8191	255.255.224.0
10.10.32.0	8191	255.255.224.0
10.10.64.0	8191	255.255.224.0
10.10.96.0	8191	255.255.224.0
10.10.128.0	8191	255.255.224.0

Central router 2 :

CIDR: 19

Possible network: 16

Network	Number of host	Net mask
10.11.32.0	8191	255.255.224.0
10.11.64.0	8191	255.255.224.0
10.11.96.0	8191	255.255.224.0
10.11.128.0	8191	255.255.224.0

First building:

CIDR: 21

Possible network: 4

Network	Number of host	Net mask
10.10.40.0	2047	255.255.248.0
10.10.48.0	2047	255.255.248.0
10.10.56.0	2047	255.255.248.0

Second building:

CIDR: 21

Possible network: 4

Network	Number of host	Net mask
10.10.72.0	2047	255.255.248.0
10.10.80.0	2047	255.255.248.0
10.10.88.0	2047	255.255.248.0

Third building:

CIDR: 21

Possible network: 4

Network	Number of host	Net mask
10.10.104.0	2047	255.255.248.0
10.10.112.0	2047	255.255.248.0
10.10.120.0	2047	255.255.248.0

Fourth building:

CIDR: 21

Possible network: 4

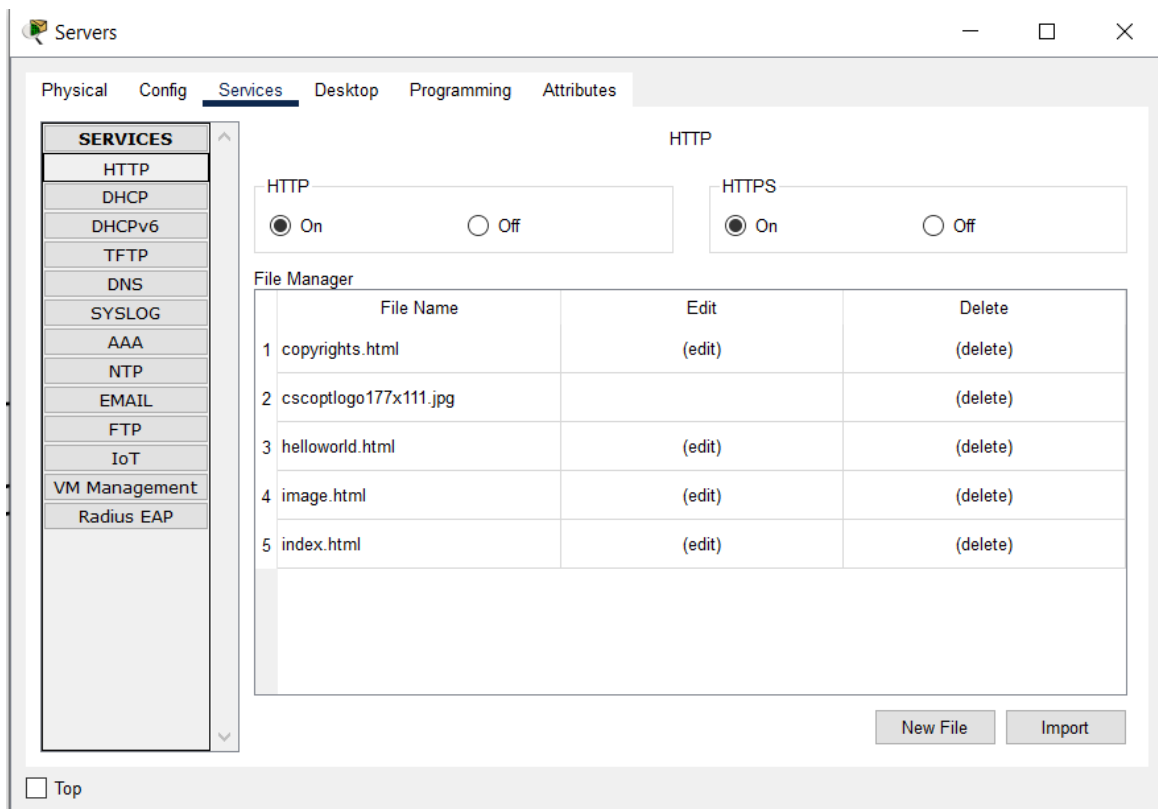
Network	Number of host	Net mask
10.10.136.0	2047	255.255.248.0
10.10.144.0	2047	255.255.248.0
10.10.152.0	2047	255.255.248.0

3.Protocols

The protocols implemented in the topology are,

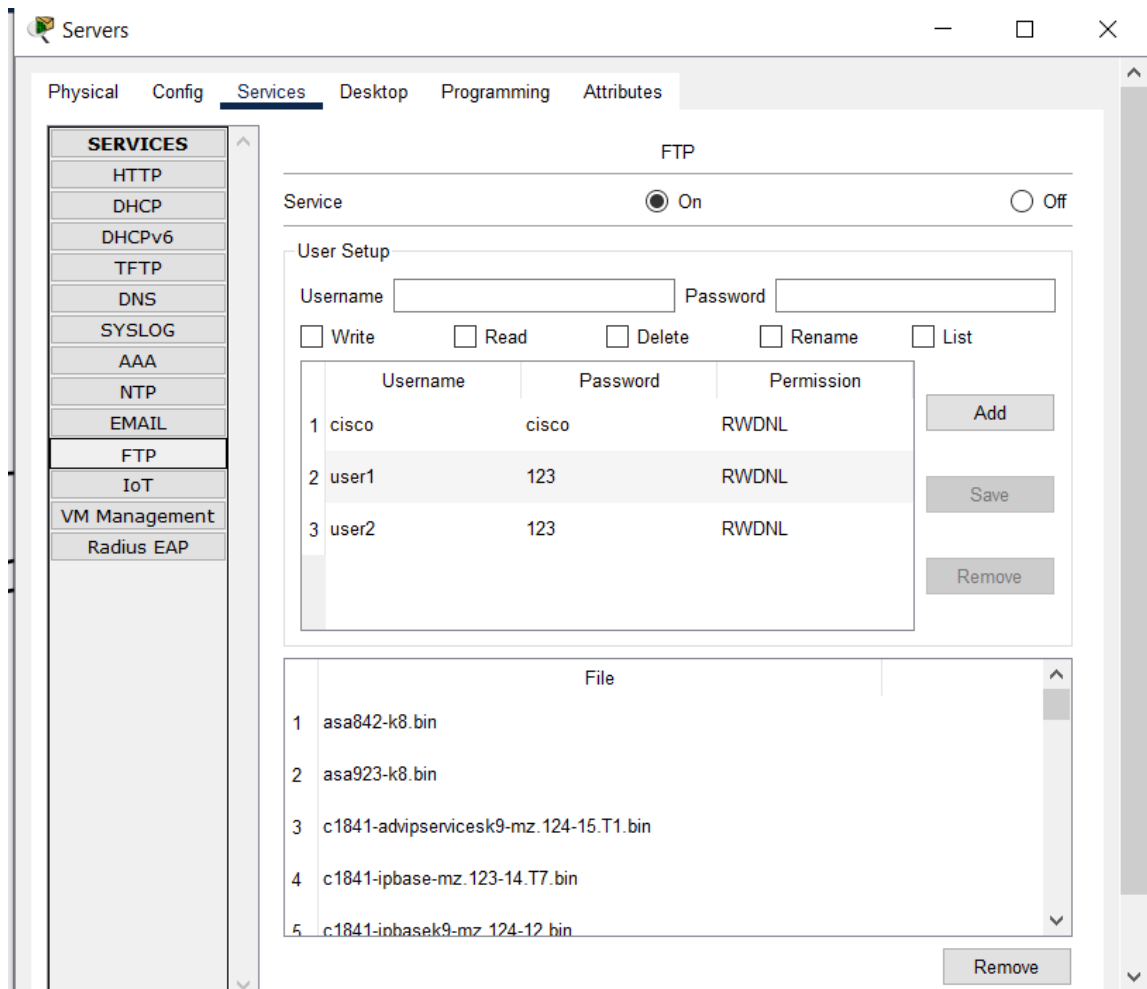
1)HTTP

The Hypertext Transfer Protocol (HTTP) is the foundation of data communication on the World Wide Web (WWW) and is used to transmit and receive data over the internet.



2)FTP

The File Transfer Protocol (FTP) is a standard network protocol used to transfer files between computers on the internet or a network



3)DHCP

Dynamic host configuration protocol used to assign ip dynamically to physical devices.

en //This enters privileged EXEC mode on the router.

conf t //This enters global configuration mode on the router.

ip dhcp pool firstfloor //This creates a new DHCP pool named "firstfloor" on the router.

network 10.10.40.0 255.255.248.0 //This specifies the network address and subnet mask of the DHCP pool.

default-router 10.10.40.1 //This sets the default gateway for clients using this DHCP pool to the IP address 10.10.40.1.

ip dhcp excluded-address 10.10.40.1 //This specifies that the IP address 10.10.40.1 should not be assigned by the DHCP server. This address is reserved for the default gateway that was set in the previous command.

ip name-server 10.10.0.2 //This sets the DNS server for clients using this DHCP pool to the IP address 10.10.0.2.

do write memory //Save the current configuration.

ip dhcp pool secondfloor

network 10.10.48.0 255.255.248.0

default-router 10.10.48.1

ip dhcp excluded-address 10.10.48.1

ip name-server 10.10.0.2

do write memory

```
ip dhcp pool thirdfloor  
network 10.10.56.0 255.255.248.0  
default-router 10.10.56.1  
ip dhcp excluded-address 10.10.56.1  
ip name-server 10.10.0.2  
do write memory
```

```
en
```

```
conf t
```

```
ip dhcp pool firstfloor  
network 10.10.136.0 255.255.248.0  
default-router 10.10.136.1  
ip dhcp excluded-address 10.10.136.1  
ip name-server 10.10.0.2  
do write memory
```

```
ip dhcp pool secondfloor  
network 10.10.144.0 255.255.248.0  
default-router 10.10.144.1  
ip dhcp excluded-address 10.10.144.1  
ip name-server 10.10.0.2  
do write memory
```

```
ip dhcp pool thirdfloor  
network 10.10.152.0 255.255.248.0
```

default-router 10.10.152.1

ip dhcp excluded-address 10.10.152.1

ip name-server 10.10.0.2

do write memory

4)DNS

The Domain Name System (DNS) is a hierarchical decentralized naming system for computers, services, or any resource connected to the Internet or a private network.

SERVICES

- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS**
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management
- Radius EAP

DNS

DNS Service ☒ On ☐ Off

Resource Records

Name Type **A Record** ▼

Address

Add **Save** **Remove**

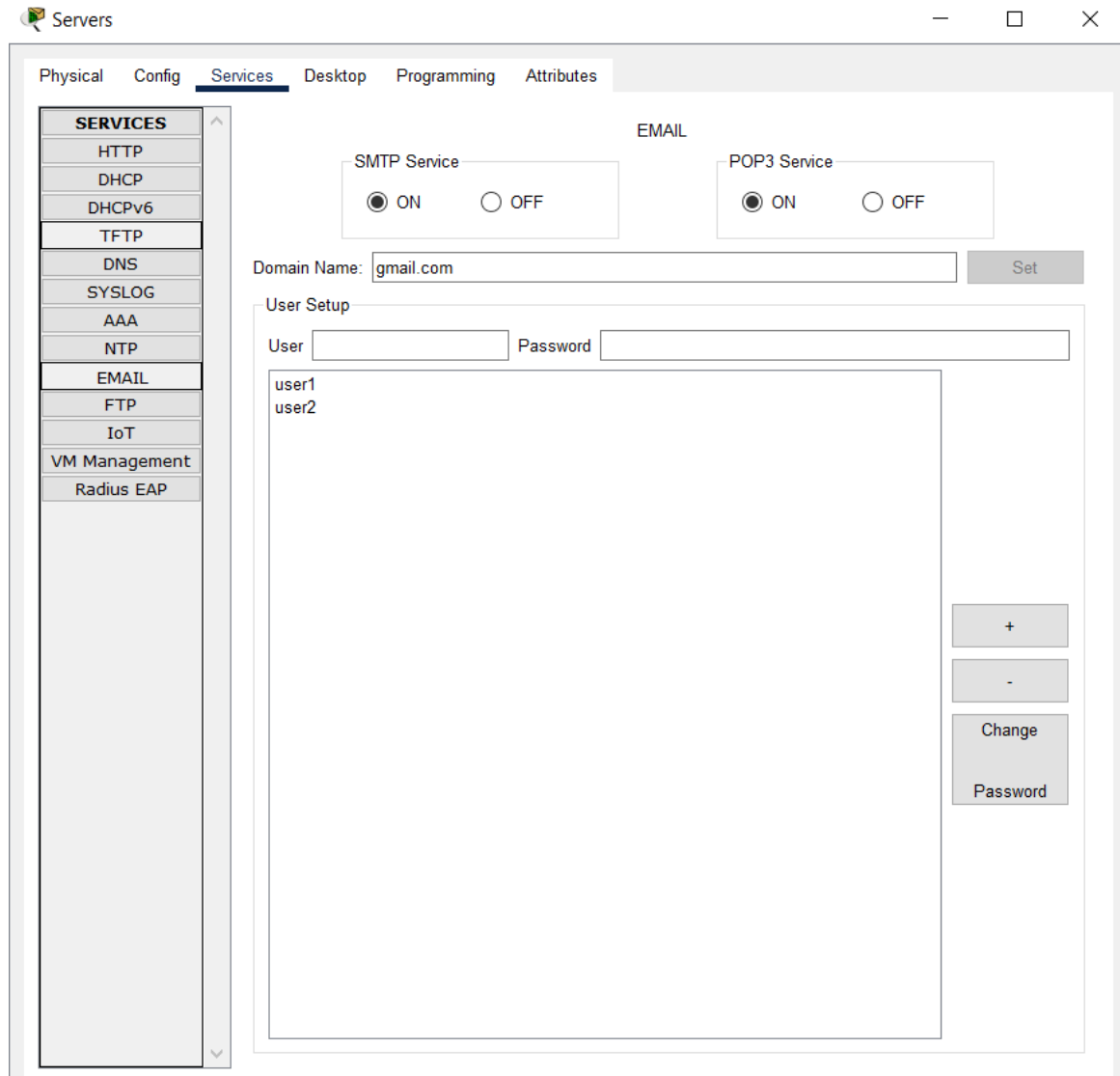
No.	Name	Type	Detail
0	file.com	A Record	10.10.0.2
1	gmail.com	A Record	10.10.0.2
2	web.com	A Record	10.10.0.2

DNS Cache

☐ Top

5)SMTP

The Simple Mail Transfer Protocol (SMTP) is a standard protocol used for sending and receiving email messages between servers and clients.



6)RIP

The Routing Information Protocol (RIP) is a distance-vector routing protocol used in local area networks (LANs) and wide area networks (WANs) to determine the best path for data to travel between two nodes or devices.

Example of code snippet to enable RIP in first building router:

```
router rip
```

```
version 2
```

```
network 10.10.40.0
```

```
network 10.10.32.0
```

```
network 10.10.48.0
```

```
network 10.10.56.0
```

```
network 10.11.32.0
```

```
do write memory
```

The **router rip** command enables RIP routing on the router. The **version 2** command specifies that RIP version 2 should be used. This version includes support for variable-length subnet masks (VLSM) and multicast updates.

The **network** commands specify the network addresses that should be advertised using RIP. In this configuration, five networks are being advertised: 10.10.40.0, 10.10.32.0, 10.10.48.0, 10.10.56.0, and 10.11.32.0.

The **do write memory** command saves the current configuration to non-volatile memory, so that it will be retained after a reboot.

7) NAT

In Dynamic NAT, IP addresses are dynamically mapped to each other on a one-to-one basis as per the needs. It establishes a mapping between an Inside Local IP address and a pool of Global IP addresses.

Central routers were NAT enabled routers
commands:

en

conf t

Configure the router's outside interface

int f0/6

ip nat outside

exit

Configure the router's inside interface

int f0/0

ip nat inside

exit

int f0/1

ip nat inside

exit

int f0/9

ip nat inside

exit

int f0/8

ip nat inside

exit

Configure the pool of global IP addresses

ip nat pool pool1 72.10.11.2 72.10.11.6 netmask

255.255.255.0

Configure access-list that has list of inside address that will be translated

access-list 1 permit 10.10.0.0 0.0.255.255

Enable the NAT

ip nat inside source list 1 pool pool1

4.Financial Analysis

SI.No	Equipment	per unit cost	quantity	cost
1	Router,8 ports	3,30,739Rs	6	19,84,434/-
2	1Gbps ethernet cable	40Rs /m	570m	22,800/-
3	100Mbps ethernet cable	25Rs/m	19020m	4,75,500/-
4	Dell R730xd server	1,87,950Rs	1	1,87,950/-
5	Switch,48 ports	1,10,000Rs	13	14,30,000/-
6	Access point	20,351Rs	60	12,21,060/-
Total				53,21,744/-

Service charge 12% =6,38,609/-

Total cost=59,60,353/-

