OFFICE NETWORK SCENARIO (ONS)

MINI PROJECT REPORT

Submitted by

MODEM UPENDRA [Reg No: RA2011031010071]
VARUN REDDY   [Reg No: RA2011031010093]
IBRAHIM MUFEEZ [Reg No: RA2011031010100]

Under the Guidance of

Ms. M. SAFA

(Assistant Professor, Dept of Networking and Communications)

in partial fulfillment of the requirements for the degree of

BACHELOR OF TECHNOLOGY
in
COMPUTER SCIENCE ENGINEERING
with specialization in Information Technology

DEPARTMENT OF NETWORKING AND COMMUNICATIONS
COLLEGE OF ENGINEERING AND TECHNOLOGY
SRM INSTITUTE OF SCIENCE AND TECHNOLOGY
KATTANKULATHUR- 603 203
JUNE-2022

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY KATTANKULATHUR - 603 203

BONAFIDE CERTIFICATE

Certified that 18CSS202J project report titled "OFFICE NETWORK SCENARIO **ONS" is the bonafide work of MODEM UPENDRA [Reg No: RA2011031010071] VARUN REDDY [Reg No: RA2011031010093 IBRAHIM MUFEEZ [Reg No:RA2011031010100]** who carried out the mini project work under my supervision along with the Team Members. Certified further, that to the best of my knowledge the work reported herein does not form any other internship report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE   SIGNATURE

MS.M. SAFA   DR. ANNAPURANI PANAIYAPPAN .K

SUPERVISOR   **HEAD OF THE DEPARTMENT**
Assistant Professor   Networking and Communications
Networking and
Communications

Signature of the Internal Examiner   **Signature of the External Examiner**

Office Network Scenario Implementation by using RIP In Cisco Packet Tracer

Abstract: Different users are there for the project; the users are present in different Department at different places. By this, a request is induced by one of the other users to interface with other user/users or sharing some data with them. And The user Data Can be Stored in the Server Where they can access it any time There can be a condition where a message is to be broadcasted to entire Office by a user. So, this paper is about communication among divergent users present at different sites, sharing this Different network. ONS Stands for the Office network scenario.

 Keyword: ONS, CCNA, CISCO, IP, ROUTER, RIP(**Routing** Information **Protocol**).

1. INTRODUCTION OF ONS

This Office Network Scenario is about designing a topology of a network that is a LAN (Local Area Network) for an Office in which various computers of different departments are set up so that they can interact and communicate with each other by interchanging data from different Network. To design a networking scenario for an Office which connect various departments to each other's, it puts forward communication among different departments. ONS is used to design a systematic and well-planned topology, satisfying all the necessities of the Office (i.e., client). ONS come up with a network with good performance. ONS is also providing security and authentication to forbid unauthorized logins.

2. TECHNOLOGY TO BE USED

CCNA: Cisco Certified Network Associate .CCNA is a well-liked certification in computer networking that is developed by Cisco Systems. CCNA is discovered by the 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 ONS.

3. BASIC ARCHITECTURE :
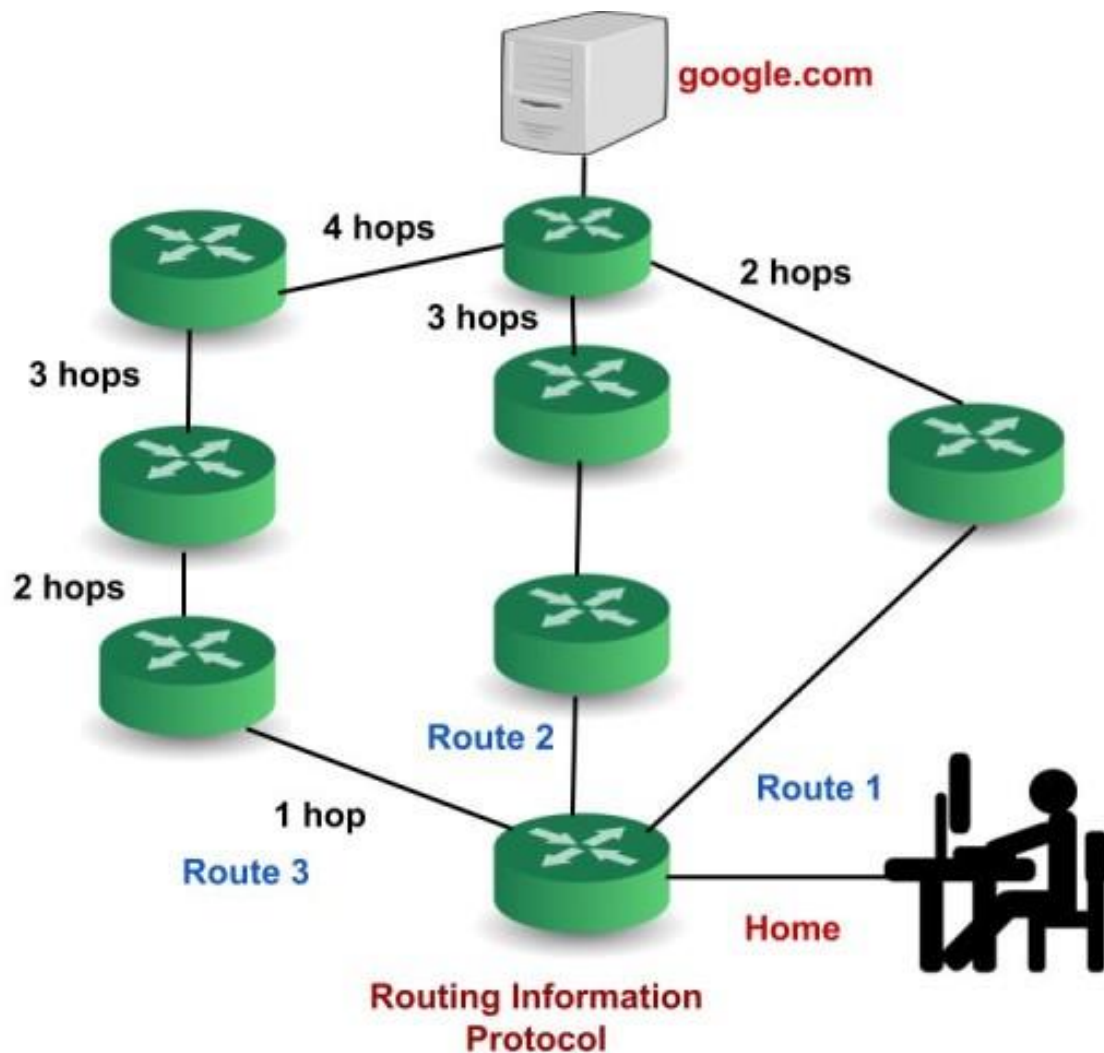
The basic architecture of ONS generally makes use of various types of computers, router, servers, switches, Printer, personal PC's and Laptops.

4. WORKING OF ONS

This job with respect to the Office 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. Various departments can simply divide the required data without any problem and can exchange their data without going to them physically, for example like a phone call, thus conserving energy and time.
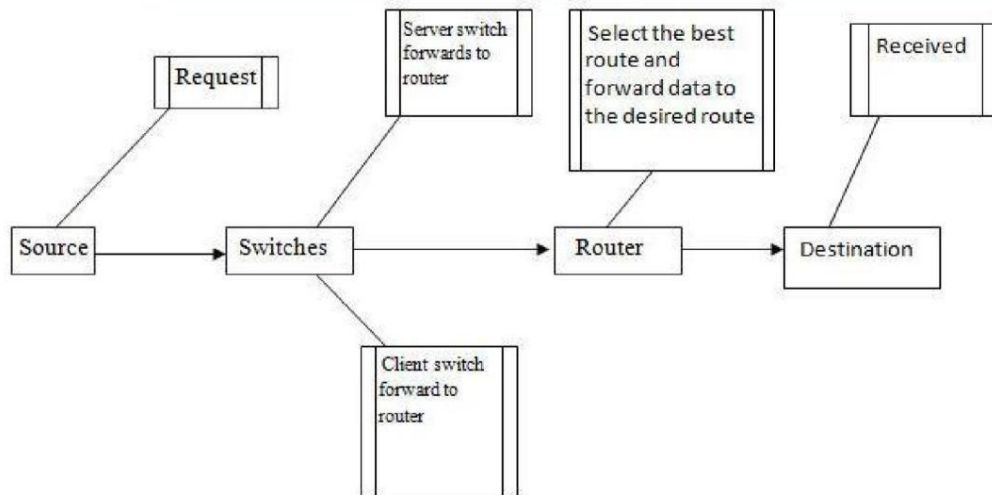
Major components and their communication

5. REQUIREMENTS

The following division talk about the requirements interconnected to the interfaces for using communication by taking lots of data. These data combine client, software interfaces and other hardware that privilege the system to take its loads

5.1 User Interfaces

The requirements represent in this module discuss the ONS interfaces. The requirements are gathered in order to the main characteristics implemented in the system. The requirements always maintain the movements interconnected with the subheading characteristics.

5.2 Interface Formats

• The screen will be shown in virtual topology which that the Office designed.

• The network simulator that is Cisco Packet Tracer is a straightforward ,easy for implementation and gives a visual attraction of graphical user interface.

• It will display four switches ,different VLANs and 4 routers interconnected with each other.

• By clicking administrator, it will open graphical user interface for respective device.

• The configuration can be done by selecting CLI (command line interface).

5.3 System Interface In this scenario, giving data to any end device. Unauthorized user is not able to access ! "And appear a log in form to the authorized user by giving login credentials. We can reset the password by the help of network administrator.

5.4 Hardware Interfaces 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

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:

1. 3 Switches (Cisco 2960 switch) and 1 Switch (Cisco PT-Switch)
2. 4 Router (Cisco 1941 router)
3. PC (Generic) Computer system for server Cross over cable Straight through cable
4. Server
5. Printer
6. Meraki Server

Meraki Server:

The Meraki cloud solution is a centralized management service that allows users to manage all of their Meraki network devices via a single simple and secure platform.

Users are able to deploy, monitor, and configure their Meraki devices via the Meraki dashboard web interface or via APIs. Once a user makes a configuration change, the change request is sent to the Meraki cloud and is then pushed to the relevant device(s).


The Meraki dashboard: A modern web browser-based tool used to configure Meraki devices and services.

**Account:** A Meraki user's account, used for accessing and managing their Meraki organizations.

Organization: A logical container for Meraki networks managed by one or more accounts.

Network: A logical container for a set of centrally managed Meraki devices and services.
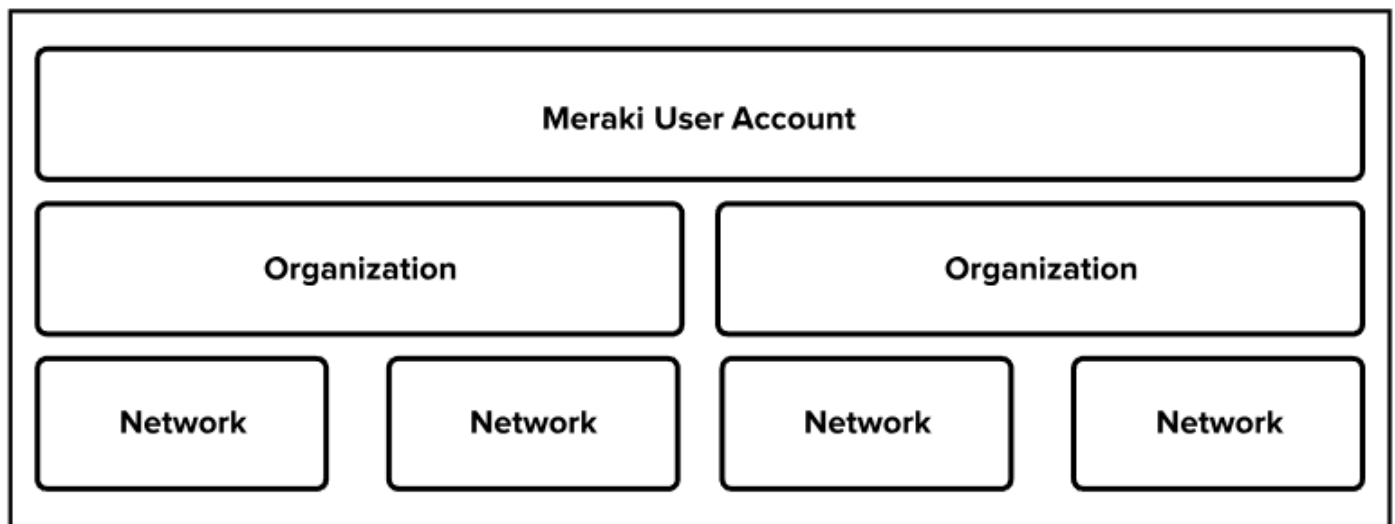
Management data: The data (configuration, statistics, monitoring, etc.) that flows from Meraki devices (wireless access points, switches, security appliances) to the Meraki cloud over a secure internet connection.

User data: Data related to user traffic (web browsing, internal applications, etc.). User data does not flow through the Meraki cloud, instead flowing directly to their destination on the LAN or across the WAN.
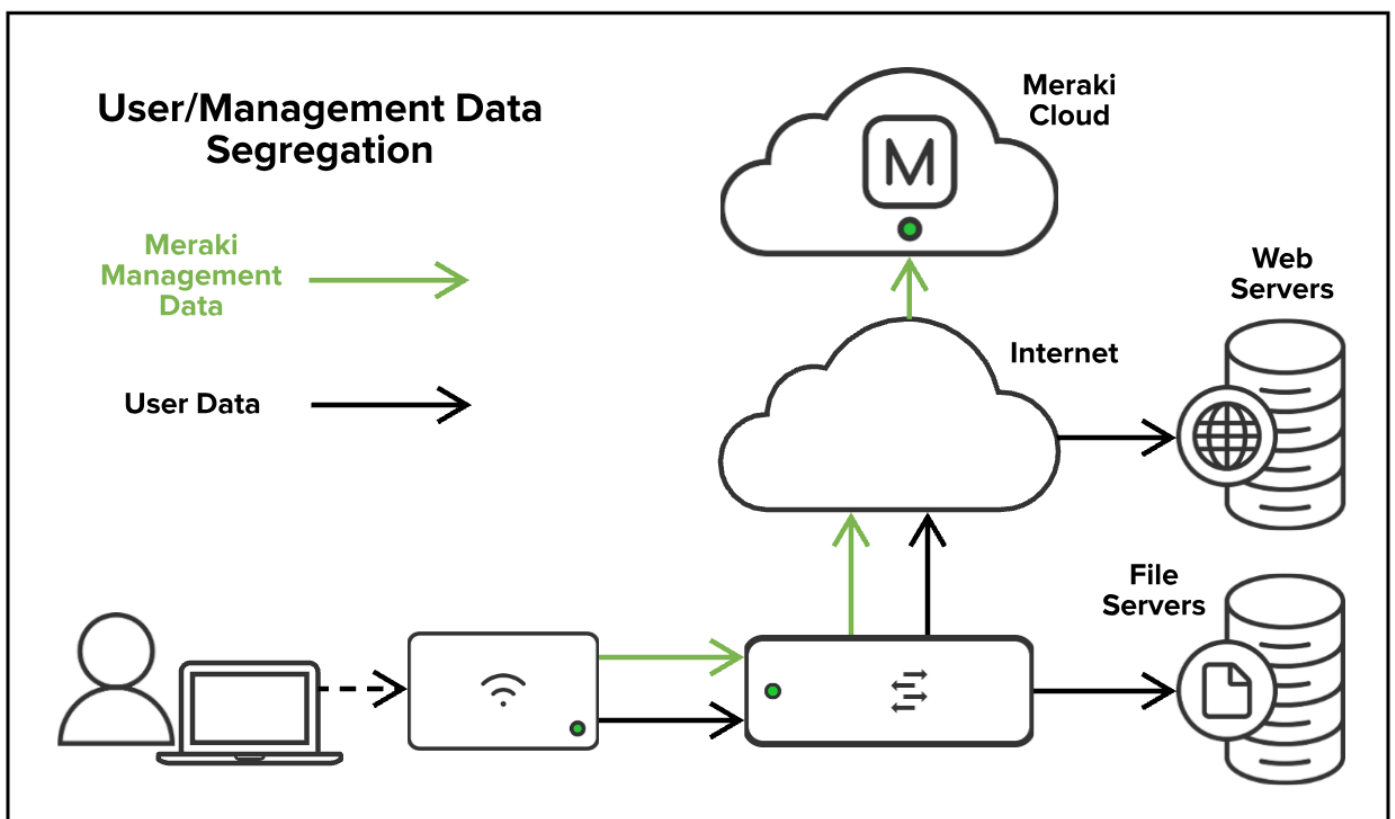
Meraki Cloud Architecture

The Meraki cloud is the backbone of the Meraki management solution. This "cloud" is a collection of highly reliable multi-tenant servers strategically distributed around the world at Meraki data centres. The servers at these data centres are powerful hosting computers comprised of many separate user accounts. They are called multi-tenant servers because the accounts share (equal) computing resources on their host (the server). However, even though

these accounts share resources, Meraki ensures that customer information is kept secure by restricting organization access based on account authentication, as well as hashing authentication information such as user passwords or API keys.
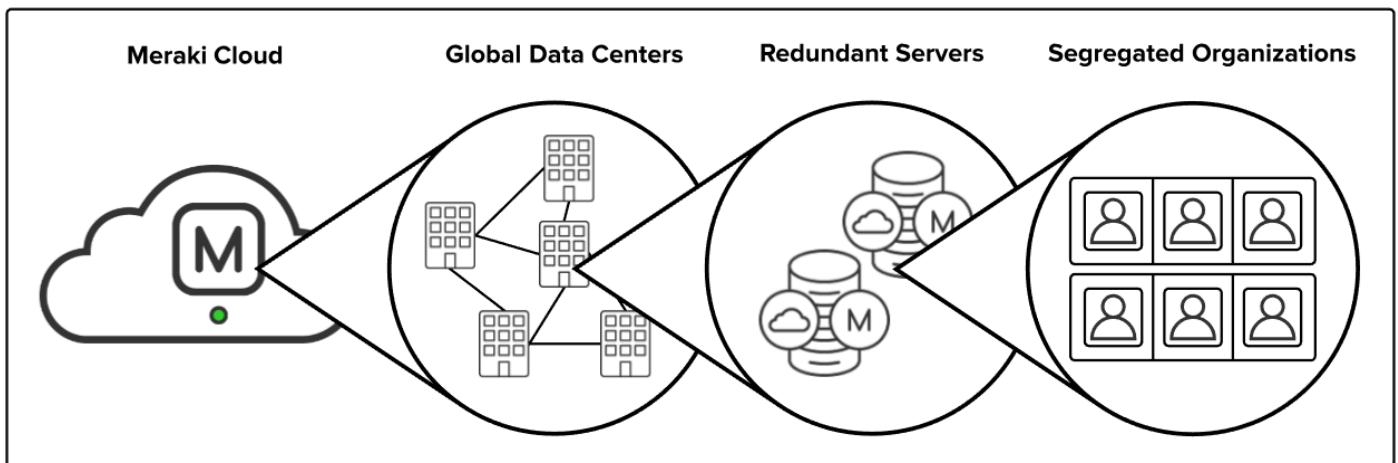
5.5 Software Interfaces:

The requirements required in the ONS are as follows:

- Operating System: - Microsoft Windows 7 or above.
- Cisco Packet Tracer

5.6 Communication Interfaces
- ➤ The execution of the system will be in the existing network.
- ➤ The system is mainly based on a client-server application where the server providing data to access all the services.

6. IP DESCRIPTION OF ONS

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 IPv4 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 Office; for this network the IP to be used is a class C IP addresses i.e., 192.168.10.0 with a subnet mask of 255.255.255.224. 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.

Routing Information Protocol (RIP) is a dynamic routing protocol that uses hop count as a routing metric to find the best path between the source and the destination network. It is a distance-vector routing protocol that has an AD value of 120 and works on the Network layer of the OSI model. RIP uses port number 520.

Hop Count

Hop count is the number of routers occurring in between the source and destination network. The path with the lowest hop count is considered as the best route to reach a network and therefore placed in the routing table. RIP prevents routing loops by limiting the number of hops allowed in a path from source and destination. The maximum hop count allowed for RIP is 15 and a hop count of 16 is considered as network unreachable.

Features of RIP

1. Updates of the network are exchanged periodically.
2. Updates (routing information) are always broadcast.
3. Full routing tables are sent in updates.
4. Routers always trust routing information received from neighbour routers. This is also known as *Routing on* rumours.

RIP versions :

There are three versions of routing information protocol – **RIP Version1**, **RIP Version2**, and **RIPng**.
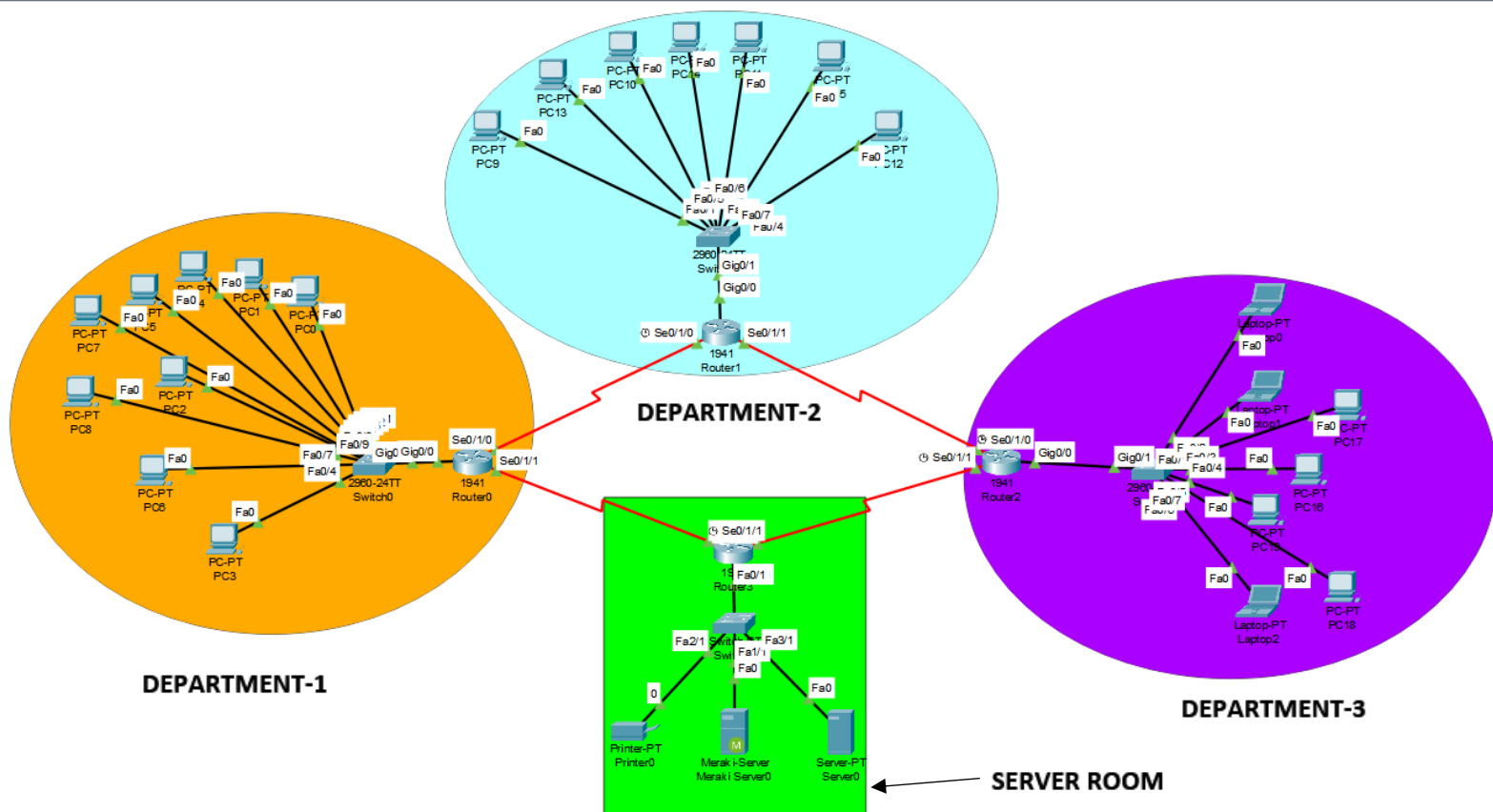
7. PRODUCT FEATURES

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

2. Tree topology is used here.

3. 4 client switches are present for the four levels of Department and they are associated to 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 on the storey.

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

6. A request is made by any system of any department and it is forwarded to client switch which furthermore transmits it to the server.
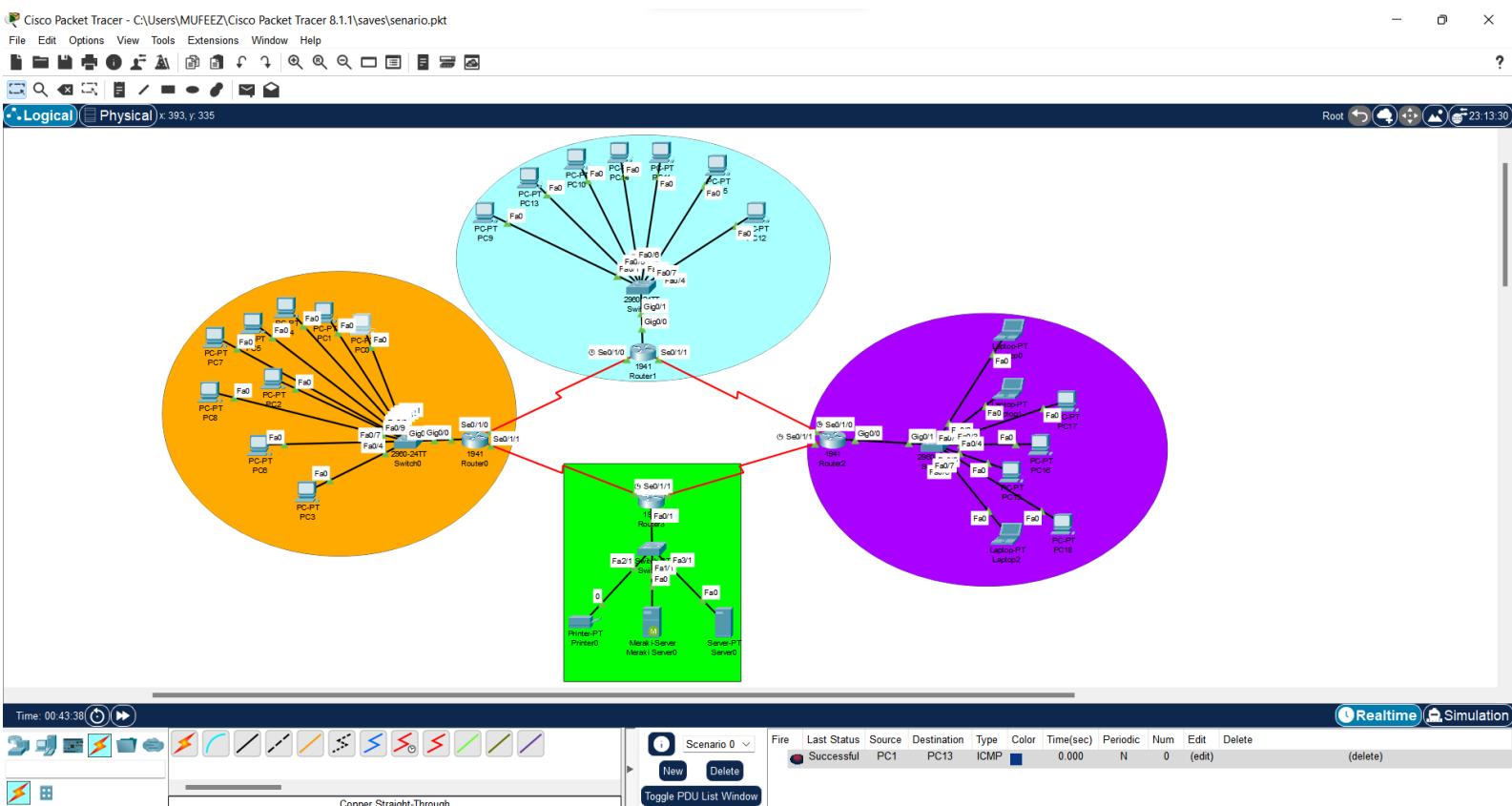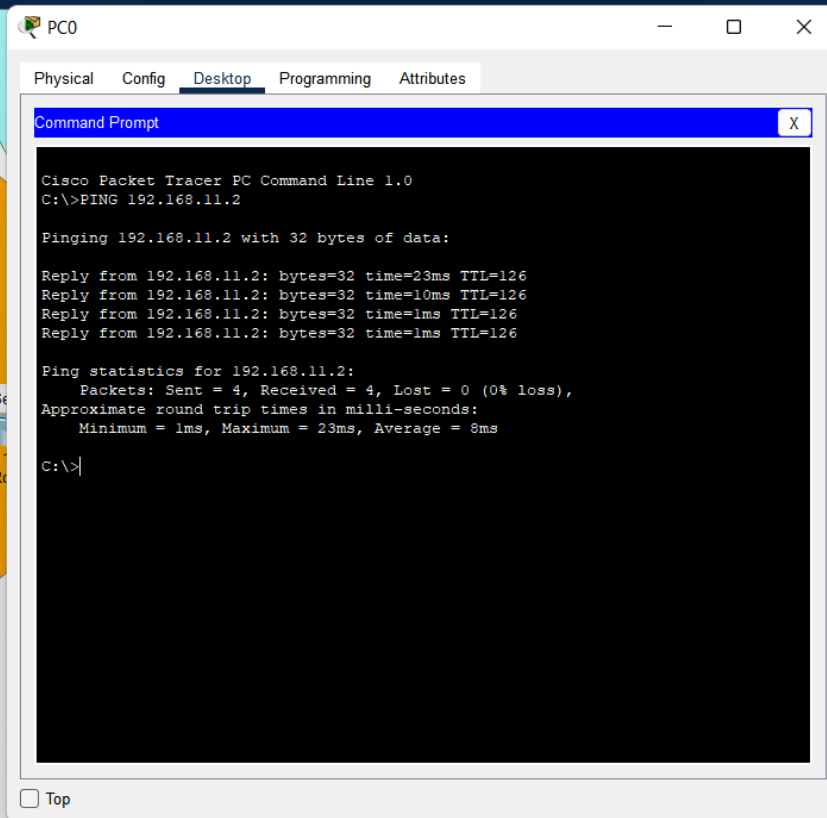
7. Port-securities are there that are executed on various ports of the switches and gives reliability.

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

9. Router serves as DHCP server for assigning IPs to the host computers and also generally routes the data to the desired destination.

10. All appliances are under the reliability of their respective passwords known to the network executive only.

11. User can change the password any time they want to.

8 . SCOPE OF ONS This project is given us an efficient methodology connected among all computers that are used in a respective Office. Apart from interconnection, the project economical is made the topology by keeping in mind about the cost. The most important points are authentication and security to prevent the unauthorized access.
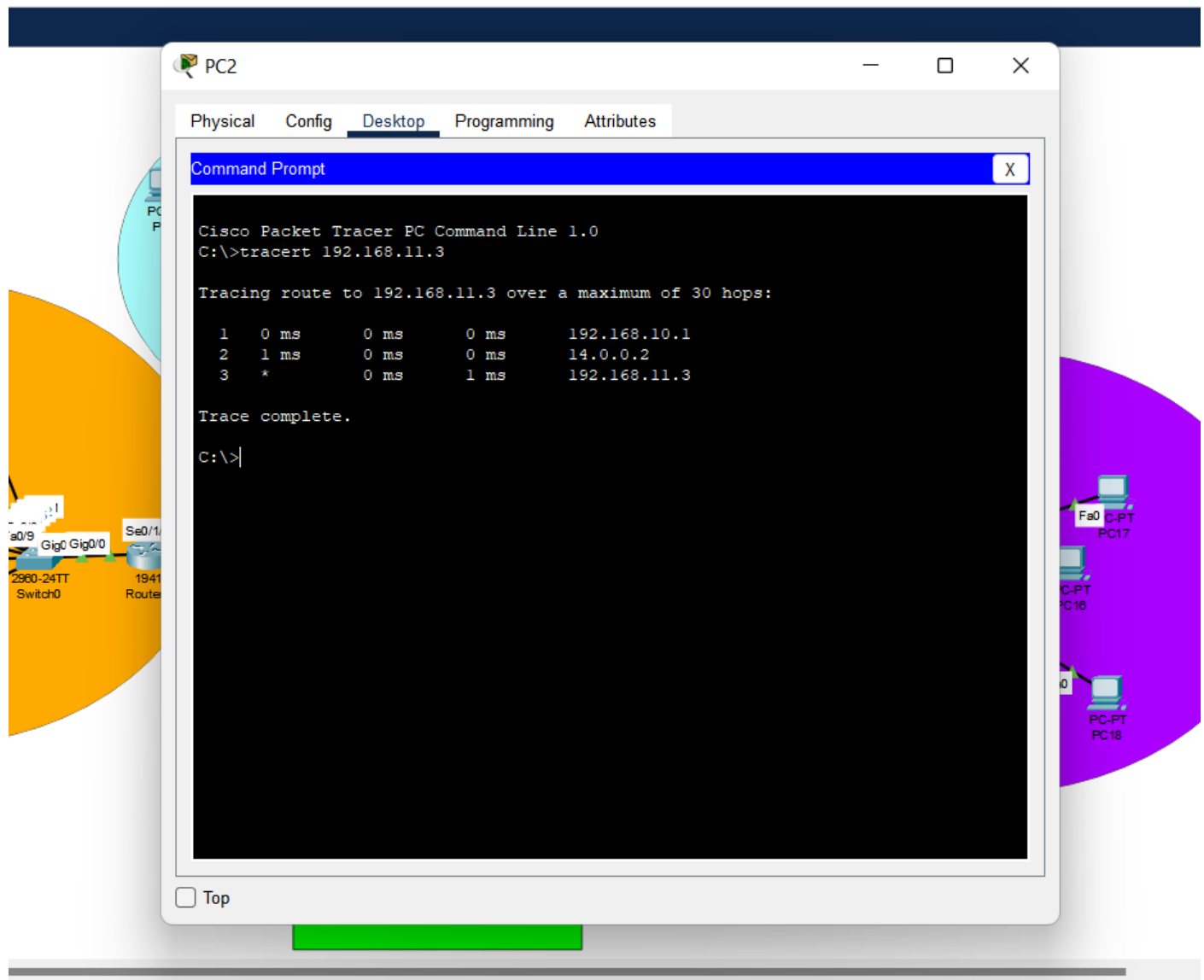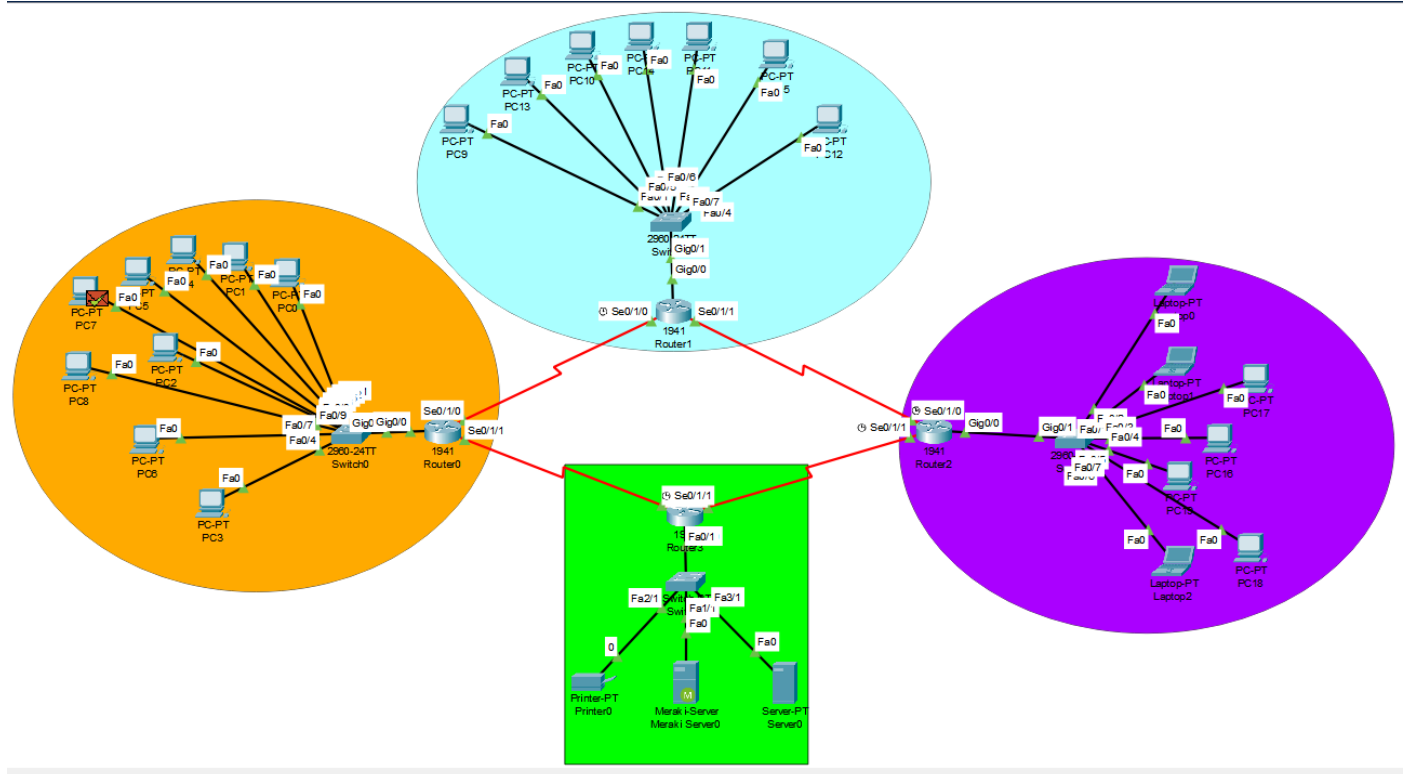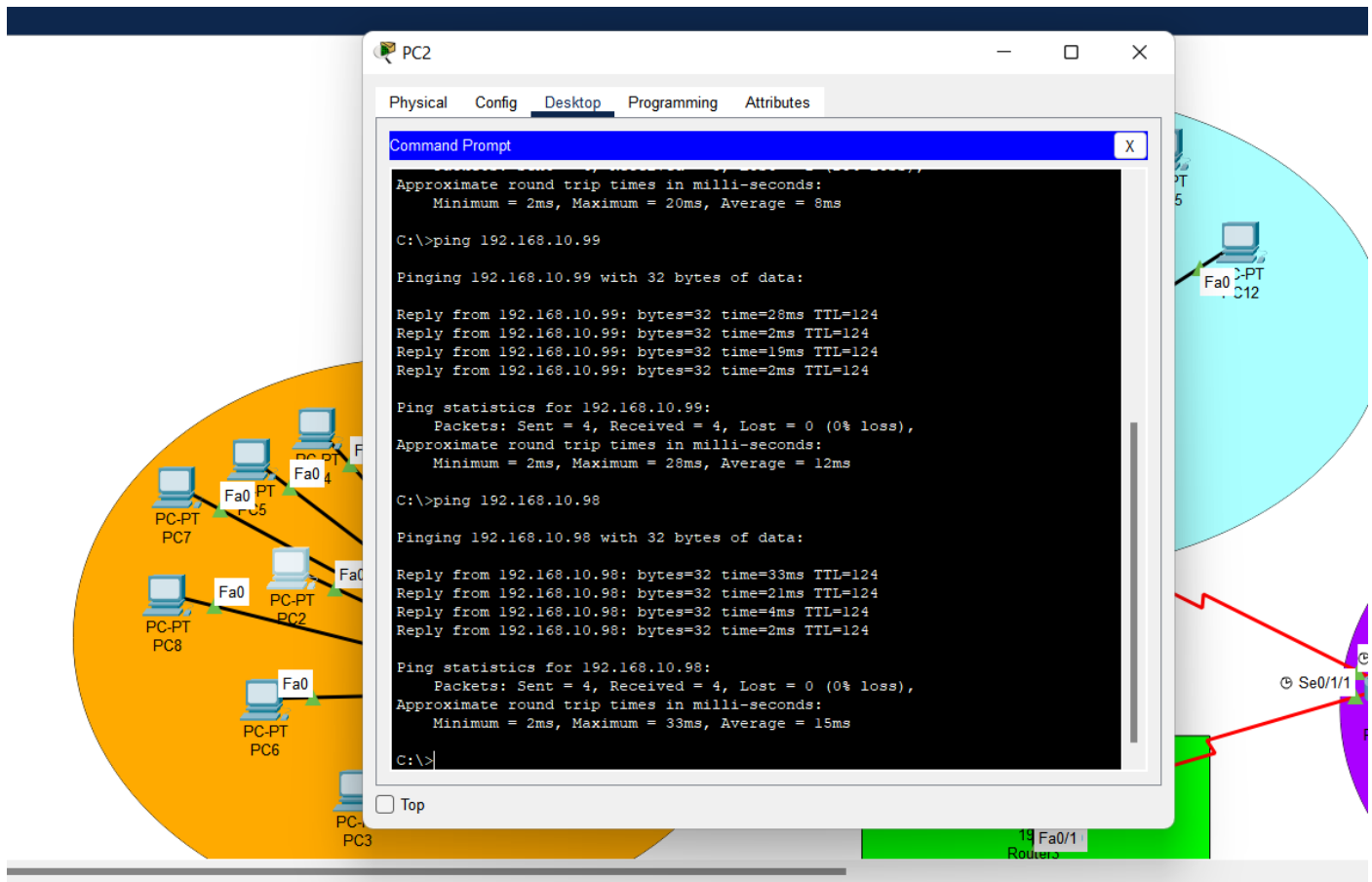
9. RESULTS OF ONS

DEPARTMENT-2

DEPARTMENT-1

DEPARTMENT-3

SERVER ROOM

PC-0 Pinging with Meraki Server


```
Cisco Packet Tracer PC Command Line 1.0
C:\>PING 192.168.11.2

Pinging 192.168.11.2 with 32 bytes of data:

Reply from 192.168.11.2: bytes=32 time=23ms TTL=126
Reply from 192.168.11.2: bytes=32 time=10ms TTL=126
Reply from 192.168.11.2: bytes=32 time=1ms TTL=126
Reply from 192.168.11.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.11.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 23ms, Average = 8ms

C:\>
```

Finding Route to the Printer Using TRACERT Command

10.CONCLUSION :-To Design the network outlook for the community college network scenario 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 learning environments, and secure classrooms. This paper describes the network design scenario approved by Cisco, as well as where we can apply these scenario within the various locations of a community Office network. Finally, key network foundation services such as switching, routing, multicast, and high availability are given for the full college 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-mode-user-mode-automatically and-moving-other-group.

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

10)https://documentation.meraki.com/Architectures_and_Best_Practices/Cisco_Meraki_Best_Practice_Design/Meraki_Cloud_Architecture#:~:text=The%20Meraki%20cloud%20solution%20is,web%20interface%20or%20via%20APIs.