

Network Design For School
A COURSE PROJECT REPORT

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BONAFIDE CERTIFICATE

Certified that this mini project report **Network Design For School** is the Bonafide work of **Ekkuluri Rajesh (RA2011003010669), Deepika Kumari (RA2011003010671), Malika Taneja (RA2011003010672), Adit Agrawal (RA2011003010674)** and **Sourabh Nahar (RA2011003010675)** who carried out the project work under my supervision.

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ABSTRACT

A network has to be designed for a school. There are a total of 230 computers in the school computer lab. The users in the lab should belong to a single domain and receive IP address dynamically from a central server with the ability to share files on a central location. Some of the users have laptops with wireless cards for which wireless access is required. The total size of the lab is 1000 sq ft. Identify appropriate solution with the detailed services, hardware and software requirements to design the appropriate network for the school.

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1. INTRODUCTION

1.1 Scenario Description

A network has to be designed for total of 230 computers in a school computer lab. The users in the lab should belong to a single domain and receive IP address dynamically from a central server.

We setup a network with a DHCP server, a switch, and 230 PCs. location. We have also included a wireless system for the users having laptops with wireless cards for the wireless access of the network.

2. LITERATURE SURVEY

A network is a device which is used to connect by a communication link. The device through which it is connected is also called Node which can be a printer, scanner, and computer. It may be any kind of devices which have the ability to send or receive the data generated by the other devices on the network. All the network work upon the protocols (which are the set of rules made for the network)

Jennifer Yick, Biswanath Mukherjee, Dipak Ghosal “Wireless Network Survey”. This paper was published in 2008. This paper gives an overview of several new applications and then reviews the literature on various aspects of WSNs. This paper classifies the problems into three different categories:

1. Internal platform and underlying operating system
2. Communication protocol stack
3. Network services, provisioning, and deployment.

This paper reviews the major development in these three categories and outline new challenges.

3. REQUIREMENTS

3.1 Requirement Analysis

From the given scenario, we draw the following requirements:

1. Identifying the appropriate hardware which would be used (Cisco Packet Tracer)
2. All users have connectivity with each other.
3. TCP/IP Network design with IP addressing
4. Features and configuration required on the hardware with explanation

We need to configure a network design keeping the following requirements in mind.

3.2 Hardware Requirement

From the given scenario, we draw the following requirements:

For Wired:

1 x Server – PT Primary Server

1 x Switches:

20 x End Devices:

For Wireless:

1x Switch(Broadband Switch)

1 x Router

2 x End Devices(Public Network PCs)

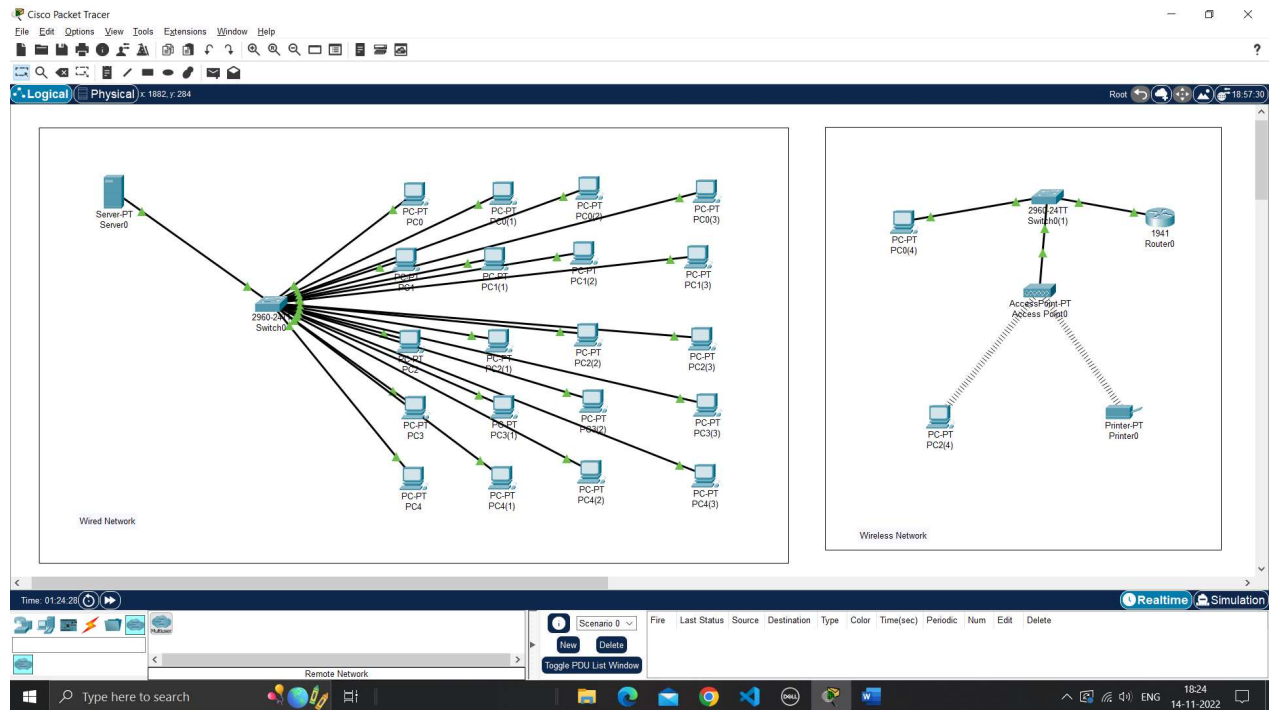
1 x Access Pointer

1 x Printer

4. ARCHITECTURE AND DESIGN

4.1 Network Architecture

The network architecture is as follows:



The architecture consists of three major networks:

- Wired Network
- Wireless Network

These networks are interconnected with each other with varying degrees (discussed in the implementation chapter).

5. IMPLEMENTATION

5.1 Address Table

The address table for wired is as follows:

Device	Interface	Address
Server	Fa0	192.168.1.1
	Default Gateway	192.168.1.254
PCs	Fa 0/0	192.168.1.10 to 192.168.1.30

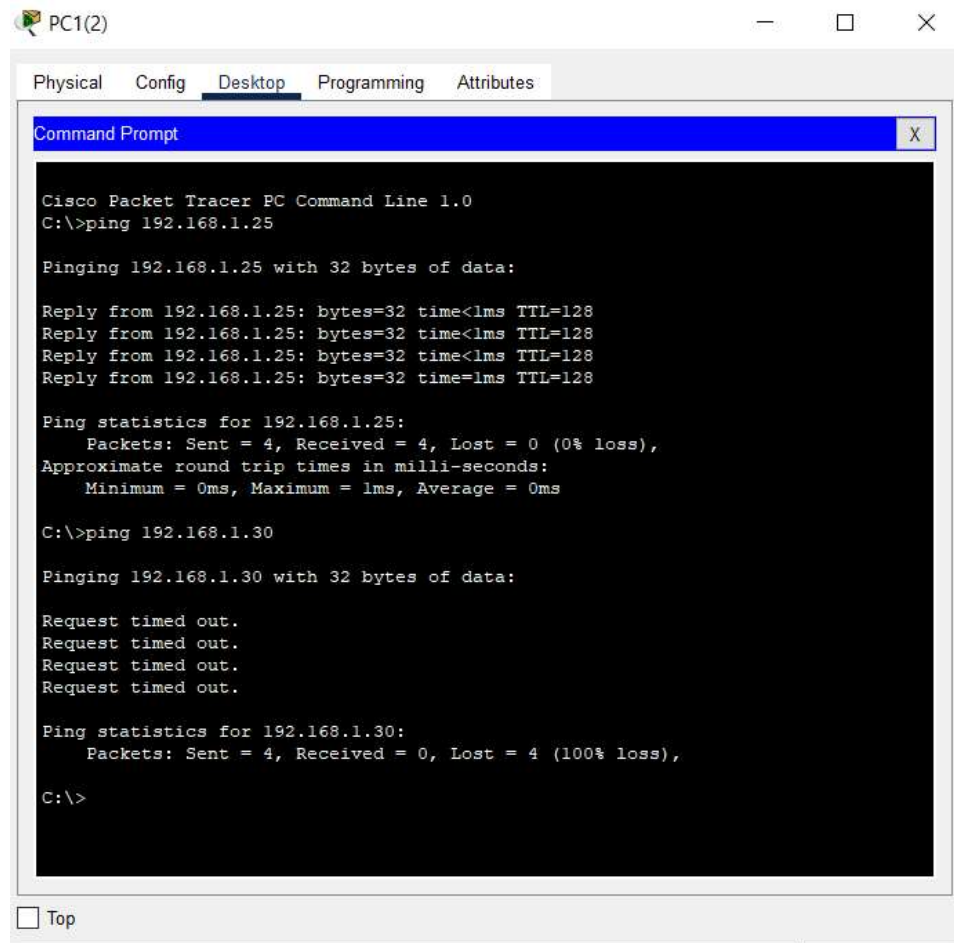
The Address table for wireless is as follows:

Device	Interface	Address
Router	Fa0/0	192.168.1.1
PC	Fa 0/0	192.168.1.3
	Default Gateway	192.168.1.1
Printer		192.168.1.4
Access Pass	Passcode: 1234567890	

6. RESULTS AND DISCUSSION

6.1 Connection Check

The network connections were checked by ping requests:



The screenshot shows a Cisco Packet Tracer PC Command Prompt window for PC1(2). The window has tabs for Physical, Config, Desktop, Programming, and Attributes. The Desktop tab is active, displaying a Command Prompt window. The Command Prompt shows the following output:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.25

Pinging 192.168.1.25 with 32 bytes of data:

Reply from 192.168.1.25: bytes=32 time<1ms TTL=128
Reply from 192.168.1.25: bytes=32 time<1ms TTL=128
Reply from 192.168.1.25: bytes=32 time<1ms TTL=128
Reply from 192.168.1.25: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.1.25:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.1.30

Pinging 192.168.1.30 with 32 bytes of data:



Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.1.30:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

At the bottom of the Command Prompt window, there is a checkbox labeled "Top" which is currently unchecked.

A wireless connection sending packages to destination:

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic
	Successful	PC0	PC1	IC...		0.000	N
	Successful	PC0	Printer0	IC...		0.000	N

7. CONCLUSION AND FUTURE ENHANCEMENT

- In conclusion, wireless communications globally are something that people can expect as technology advances.
- Wireless communications have a lot of benefits and can make the world a lot more efficient.
- The issues with security regarding access to a person's personal information or the negative impact that it may seem to have on society are a few things that are holding back the progress that wireless technology could be making.
- With more research and experiments conducted, the problems associated with wireless communications can be reduced and make it a more significant part of the world.
- Wireless technology will be very important in the near future where the need for wires connecting individual devices seems to be coming to an end.
- Since we are moving forward with continuously evolving technologies, we need an efficient, cost effective and highly secure network to support our smart devices.
- As one of the efficient technologies in wireless communication, Wi-Fi can be used for future technological advancements like IoT, 5G and beyond. In future we could expect a free wireless network almost everywhere.
- It does have concerns though as with every other new advancement that is made in today's world.

REFERENCES

- 1) <https://www.youtube.com/watch?v=UFy0icmOI0k>
- 2) [Literature review on network security in Wireless Mobile Ad-hoc Network for IoT applications: network attacks and detection mechanisms | Emerald Insight](#)