Assignment 1

Problem Statement:

Setup a wired LAN using Layer 2 switch and then IP switch of minimum four computers. It includes preparation of cable, testing of cable using line tester, configuration machine using IP addresses testing using PING utility and demonstrate the PING packets captured traces using Wireshark.

Objectives:

1) Understand LAN and how it works.
2) Preparing cable and studying the PING utility and traces packets using wireshark.
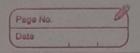
S/w and H/w Requirements

1) Crimping tool, cables, RT-45 plug, 4 computer machines
2) Wireshark software.

Theory:

What is LAN?

LAN is a collection of devices connected together in one physical location, such as building office or home. A LAN can be small or large, ranging from a home network with one user to an enterprise network with thousands of users and devices in office or school.

A LAN comprises cable, access points, switches, routers, and other components that enable devices to connect to internal servers, web servers, and other LAN via wide area network. The rise of virtualization has also fueled the development of virtual LANs, enable network administrators to logically group network nodes and partition their network without a need for infrastructure changes.

The advantages of a LAN are the same as those for any group of devices networked together. The devices can use a single Internet connection, share files with one another, print or shared printers and be accessed and even controlled by one another.

Ethernet cables :

Ethernet cable can come in two forms when it comes to wiring.

1) Straight through cable.

This cable type has identical wiring on both ends (pin on one end of the cable is connected to pin at the other end of the cable, pin 2 is connected to pin2 etc)

Pin		Pin	Colour Pattern
1	————————————	1	Orange white
2	————————————	2	Orange
3	————————————	3	Green white
4	————————————	4	Blue
5	————————————	5	Blue white
6	————————————	6	Green
7	————————————	7	Brown white
8	————————————	8	Brown.

2) Crossover Cables.

The purpose of a crossover ethernet cable is to directly connect one computer to another computer without going through a router hub

Colour Pattern	Pin		Pin	Colour Pattern
Orange white	1		1	Green white
Orange	2		2	Green
Green white	3		3	Orange white
Green Blue	4		4	Brown
Blue-white	5		5	Brown-white
Green	6		6	Orange
Brown-white	7		7	Blue-white
Brown	8		8	Blue

Setting up LAN :

1) Installation of ethernet card in machine.

2) Crimping of ethernet cable.

3) Make straight cable in order form star topology network to connect 2 different types of components. eg. PC to switch or PC or router.

4) Make cross cable in order to form a star topology network to connect 2 similar types of components.

IP switching is a routing technique which routes data packets faster than traditional routing by using switches.

Wireshark Packet Analyzer tool

Wireshark, a network analysis tool formely known as ethereal, captures packets in real time and them in human readable format. Wireshark includes filters, color-coding and other features that let you dig deep into network traffic and inspect individual packets.

Conclusion

Successfully implemented Layer 2 switches and IP switching and learnt about wireshark packet analyzing.