

Assignment No. 1

Date:

Title: Study of existing LAN

Problem Statement:

~~Start~~

Part A: Setup a wired LAN using layer 2 switch and then IP switch of minimum four computer. It includes preparation of cable, testing of cable using line tester, configuration machine IP addresses, testing using PING utility and demonstrate the PING packets captured traces using Wireshark packet analyzer tool.

Part B: Extend the same assignment for wireless using access point.

Objectives:

1. To understand the structure and working of various networks including the interconnecting devices used in them.
2. To get hands on experience of making and testing cables.

Outcome:

We will be able to set a wired LAN connection of minimum four PC's and analyze the packets using Wireshark packet analyzer tool.

Pre-requisites:

Knowledge of components such as ethernet cord, cable type, connections, topologies.

Theory:

LAN: A Local Area Network is a computer network that interconnects computer within a specific location. LANs maybe found in homes, offices, or other areas.

There are mainly 2 types of LAN:-

1. Wired LAN
2. Wireless LAN

1. Wired LAN:

Also called ethernet networks, are the most common type of local area network technology. A wired network is simply a collection of 2 or more computers, printers and the other devices linked by ethernet cables.

Requirements:

- machines with ethernet cord
- cat 5 or cat 6 cable
- RJ45 connector
- Switch
- Crimping tool

Steps for setting up LAN:

1. Installation of ethernet cord in machine.
2. Crimping of ethernet cable.
3. Making straight cable in order to form star topology network to connect 2 different types of components eg. PC to switch or PC or PC to router.
4. Make cross cable in order to form star topology network to connect 2 similar types of components.
5. Connect the cable to switch and form star topology.
6. Assign IP address to machine 1, 2, 3 and 4 and ping from one machine to another.

Crimping:

1. Take the ethernet cable cat6. Strip the cable back 1 inch from end using the crimping tool.
2. Untwist and straighten the wires inside the cable.
3. Arrange the wires into right order.
4. Level the wires and insert into RJ45 connector. Insert wires such as that small metal pins are facing up. Insert & properly fill the end.

5. Stick connector into crimping port of crimping tool and squeeze.

Wireless LAN:

These are wireless computer networks that are high frequency radio waves instead of cable connecting devices.

Requirements:

- Machines, pc and laptops
- DSL router
- Modem
- ISP

Steps:

1. Connect modems to telephone wire to connect with ISP to get internet connection.
2. Connect access point through RJ45 connector.
3. Setup the router.
 - IP configuration
 - DHCP configuration
 - Security configuration
4. Assign IP to machine automatically or manually.
5. Connect PCs to router.

~~So~~ : So, in this way we can connect the devices in LAN wirelessly or wired. For wired, we used ethernet and for wireless, we use access point.

Advantages:

Wired networks:

1. Highest speed
2. Stable connection
3. Reliable

Wireless networks

1. Flexibility for devices
2. Portability of devices
3. Connect many devices

Testing:

Wireshark is a packet analyzer tool which analyzes the packets. It captures real time packets and display them in human readable format. Wireshark includes filters, colour coding, and other features and let us dig deep into network traffic.

Conclusion:

We successfully set a wired LAN connection of minimum four PCs and analyzed the packets using Wireshark tool.