Ex No: 1 STUDY AND PERFORM THE CONFIGURATION OF A NETWORK IN LINUX

Date:

AIM:

To study and perform the configuration of a network interface in Linux Operating System.

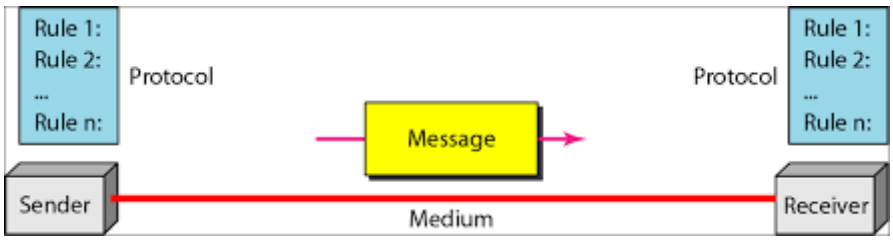
DESCRIPTION:

NETWORKING OVERVIEW:

COMPUTER NETWORK

Computer network is defined as the interconnection of nodes (computers and other devices) connected by a communication channel (wired or wireless) that facilitates communication among users and allows them to share resources.

Components *of data communication*



- **Sender:** It is the transmitter of data. Some examples are Terminal, Computer, and Mainframe.
- **Medium:** The communication stream through which the data is being transmitted. Some examples are: Cabling, Microwave, Fiber optics, Radio Frequencies (RF), Infrared Wireless
- **Receiver:** The receiver of the data transmitted. Some examples are Printer, Terminal, Mainframe, and Computer.
- **Message:** It is the data that is being transmitted from the Source/Sender to the Destination/Receiver.
- **Protocol:** It is the set of rules and regulations (resides in the form of software and hardware) that are to be followed for communication. If protocol is not present it implies the nodes are connected but they can't communicate.

CATEGORIES OF NETWORK:

The three primary categories of network are Local Area Network (LAN), Metropolitan Area Network (MAN), and Wide Area Network (WAN). The category into which a network fall is determined by its size, ownership, the distance it covers and its physical architecture.

LAN

- A LAN is usually privately owned and links the devices in a single office, building or campus.
- A LAN can be as simple as two PCs or it can extend throughout a company. LAN size is limited to a few kilometers.
- The most widely used LAN technology is the Ethernet technology developed by the Xerox Corporation.

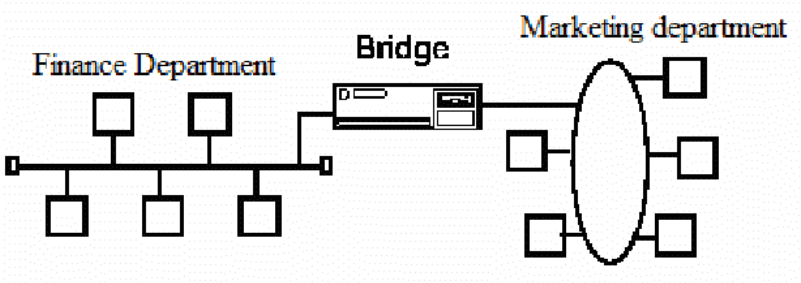


Figure 1.8: Local Area Network

MAN

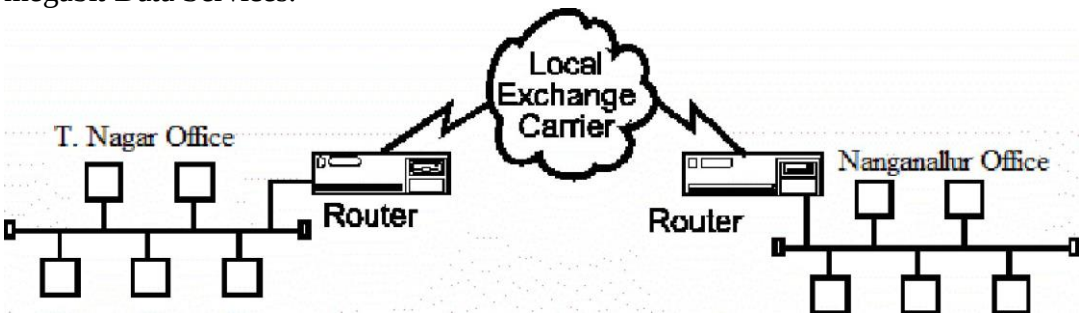
- A MAN is designed to extend over an entire city.
- It could be a single network such as cable TV network or connect a number of LANs into a larger network.
- A MAN can be owned by a private company or it may be a service provided by a public company, such as local telephone company.
- Telephone companies provide a popular MAN service called (SMDS) Switched Multi-megabit Data Services.
- 

Figure: Metropolitan Area Network

WAN

- A WAN provides long distance transmission of data, voice, image and video information over large geographic areas.
- WAN utilize public, leased, or private communication equipment usually in combinations and therefore span an unlimited number of miles.
- A WAN that is wholly owned and used by a single company is referred to as an Enterprise Network.

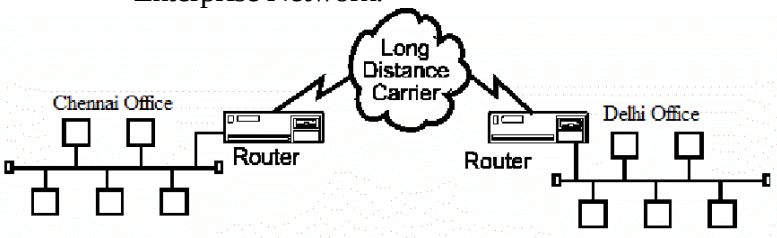


Figure 1.10: Wide Area Network

ADDRESSING IN A NETWORK:

- Every network device has two types of addresses,

1. **Logical address** -- in most cases this is the IP address- IP address is a number assigned to a connection of a device in a network. It is 32 bit length for IPv4 and 128 bit length for IPv6.

2. **Physical address** -- also known as the MAC address-A MAC address is a

number assigned to the NIC card by the manufacturer. It length is 48 bits represented in hexadecimal (6 bytes).

- A **network address** is also known as the numerical network part of an IP address. This is used to identify a network that has its own hosts and addresses. For example, in the IP address 192.168.1.1, the network address part is 192.168.1 and the network address of this IP connection is 192.168.1.0.
- A subnetwork or subnet is a logical subdivision of an IP network. The practice of dividing a network into two or more networks is called subnetting.
- **Subnet masks** are expressed in dot-decimal notation like an address. For example, 255.255.255.0 is the subnet mask for the prefix 198.51.100.0/24.

GATEWAY:

- A gateway is a hardware device that acts as a "gate" between two networks. It may be a router, firewall, server, or other device that enables traffic to flow in and out of the network. While a gateway protects the nodes within network, it also a node itself.

DNS:

- DNS. (Domain Name System) The Internet's system for converting alphabetic names into numeric IP addresses. For example, when a Web address (URL) is typed into a browser, DNS servers return the IP address of the Web server associated with that name.