

Section – A

Computer Networks

LAN, MAN, WAN

Outline of the talk

- Networking : Basic concepts
- Types of Networks
 - LAN (Local Area Network)
 - MAN (Metropolitan Area Network)
 - WAN (Wide Area Network)

Networking: Basic Concepts

- **Computer Network**
 - A communication system for connecting computers/hosts.
- **Why ?**
 - Better connectivity
 - Better communication
 - Better sharing of resources
 - Bring people together

Types of Computer Networks

■ Local Area Network (LAN)

- Connects hosts within a relatively small geographical area

- Same room
- Same building
- Same campus

Faster

Cheaper

■ Wide Area Network (WAN)

- Hosts may be widely dispersed.

- Across campuses.
- Across cities / countries / continents

Slower

Expensive

LAN and WAN : a Comparison

■ LAN

- Typical speeds
 - 10 Mbps to 10 Gbps
- Typical Cost
 - 1 crore for a hundred node LAN (one-time cost)

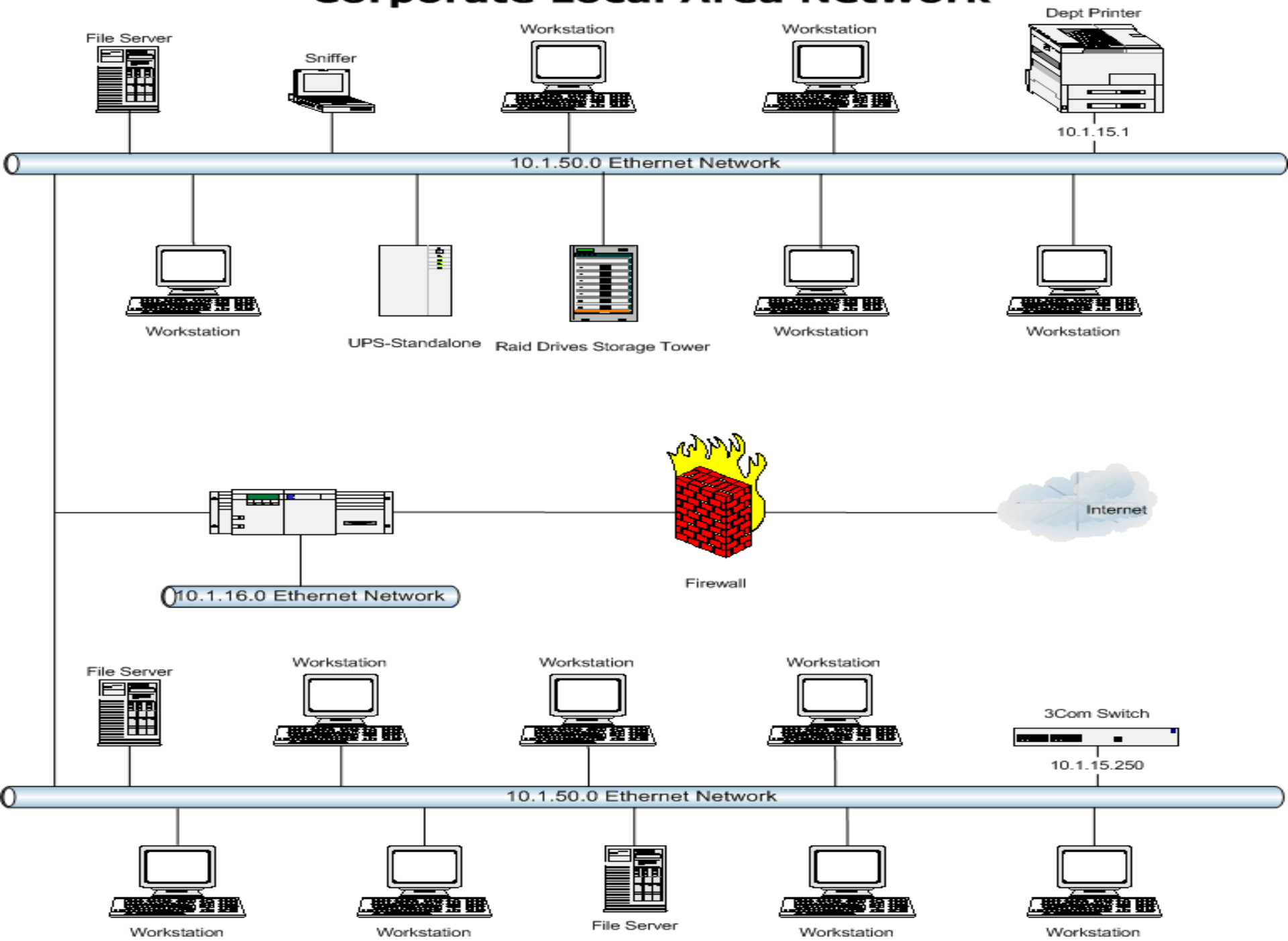
■ WAN

- Typical speeds
 - 64 Kbps to 8 Mbps
- Typical Cost
 - 30 lakhs (recurring cost)

Local Area Network (LAN)

- LAN is usually privately owned and links the devices in a single office, building or campus of up to few kilometers in size. These are used to share resources (may be hardware or software resources) and to exchange information. LANs are distinguished from other kinds of networks by three categories: their size, transmission technology and topology.
- LANs are restricted in size, which means that their worst-case transmission time is bounded and known in advance. Hence this is more reliable as compared to MAN and WAN. Knowing this bound makes it possible to use certain kinds of design that would not otherwise be possible. It also simplifies network management.

Corporate Local Area Network



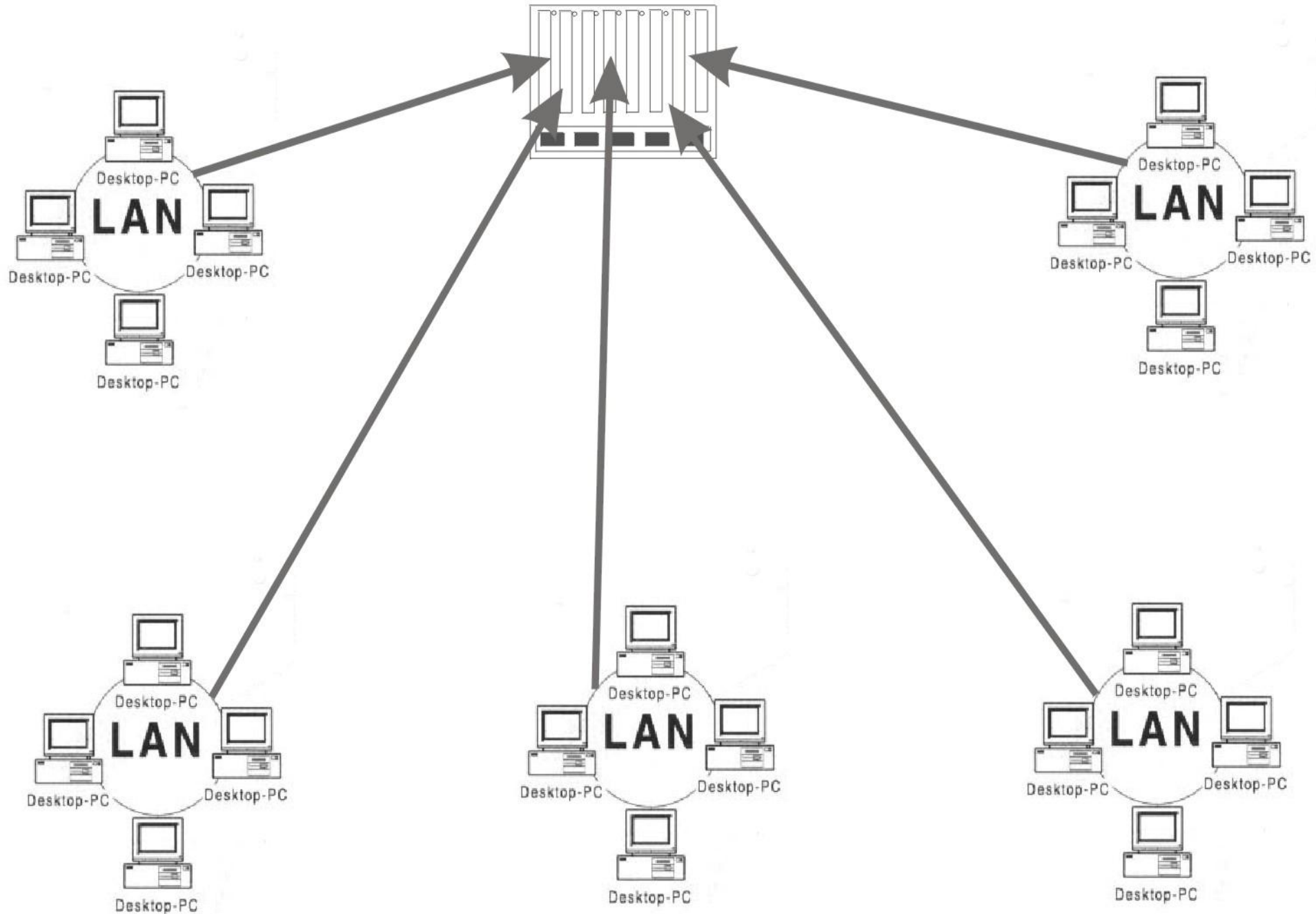
- LAN typically used transmission technology consisting of single cable to which all machines are connected. Traditional LANs run at speeds of 10 to 100 Mbps (but now much higher speeds can be achieved). The most common LAN topologies are bus, ring and star. A typical LAN is shown above in Fig.



Metropolitan Area Networks (MAN)

- MAN is designed to extend over the entire city. It may be a single network as a cable TV network or it may be means of connecting a number of LANs into a larger network so that resources may be shared as shown in below mentioned Fig. For example, a company can use a MAN to connect the LANs in all its offices in a city. MAN is wholly owned and operated by a private company or may be a service provided by a public company.

MAN



- The main reason for distinguishing MANs as a special category is that a standard has been adopted for them. It is DQDB (Distributed Queue Dual Bus) or IEEE 802.6.

Wide Area Network (WAN)

- WAN provides long-distance transmission of data, voice, image and information over large geographical areas that may comprise a country, continent or even the whole world. In contrast to LANs, WANs may utilize public, leased or private communication devices, usually in combinations, and can therefore span an unlimited number of miles as shown in Fig. below . A WAN that is wholly owned and used by a single company is often referred to as *enterprise network*.

