SECTION – A

OSI Reference Model and Network Architecture

Introduction to Computer Networks

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Introduction to Computer Networks

Outline of the talk

- **Textbooks**

- **Introduction to Computer Networks**

- **Uses of Computer Networks**

Textbooks

- *Computer Networking : A Top Down Approach Featuring the Internet, 2nd edition. Jim Kurose, Keith Ross Addison-Wesley, July 2002.*

- *Data and Computer Communication : William Stallings, 6th edition, Prentice Hall.*

- *Computer Networks : A. S. Tanenbaum, 4th edition, Prentice Hall.*

Introduction

- A Computer network is a number of computers (also known as nodes) connected by some communication lines.

- Two computers connected to the networks can communicate with each other through other nodes if they are not directly connected.

- Some of the nodes in the network may not be computers at all but they are network devices (like switches, routers etc)to facilitate communication.

Uses of computer network

- Exchange of information between different computers.

- Interconnected small computers in place of large computers.

- Communication tools

- Some applications & technologies are examples of distributed systems.

Uses of Computer Networks

A.   **Business Applications**

B.   **Home Applications**

C.   **Mobile Users**

D.   **Social Issues**

# (A) <u>Business Applications</u> of Networks(1)

1. <u>RESOURCE SHARING</u>: Goal is to make all programs, equipment, and especially data available to anyone on the network without regard to the physical location of the resource and the user.

   - Example: group of office workers share a common printer.

•Sharing information is more imp than sharing physical resources like printer, scanners etc.
•Organizations Trust Online Information over hardware resources like computers(because they get crashed or Servers may went down).

Business Applications of Networks(2)

Nancy
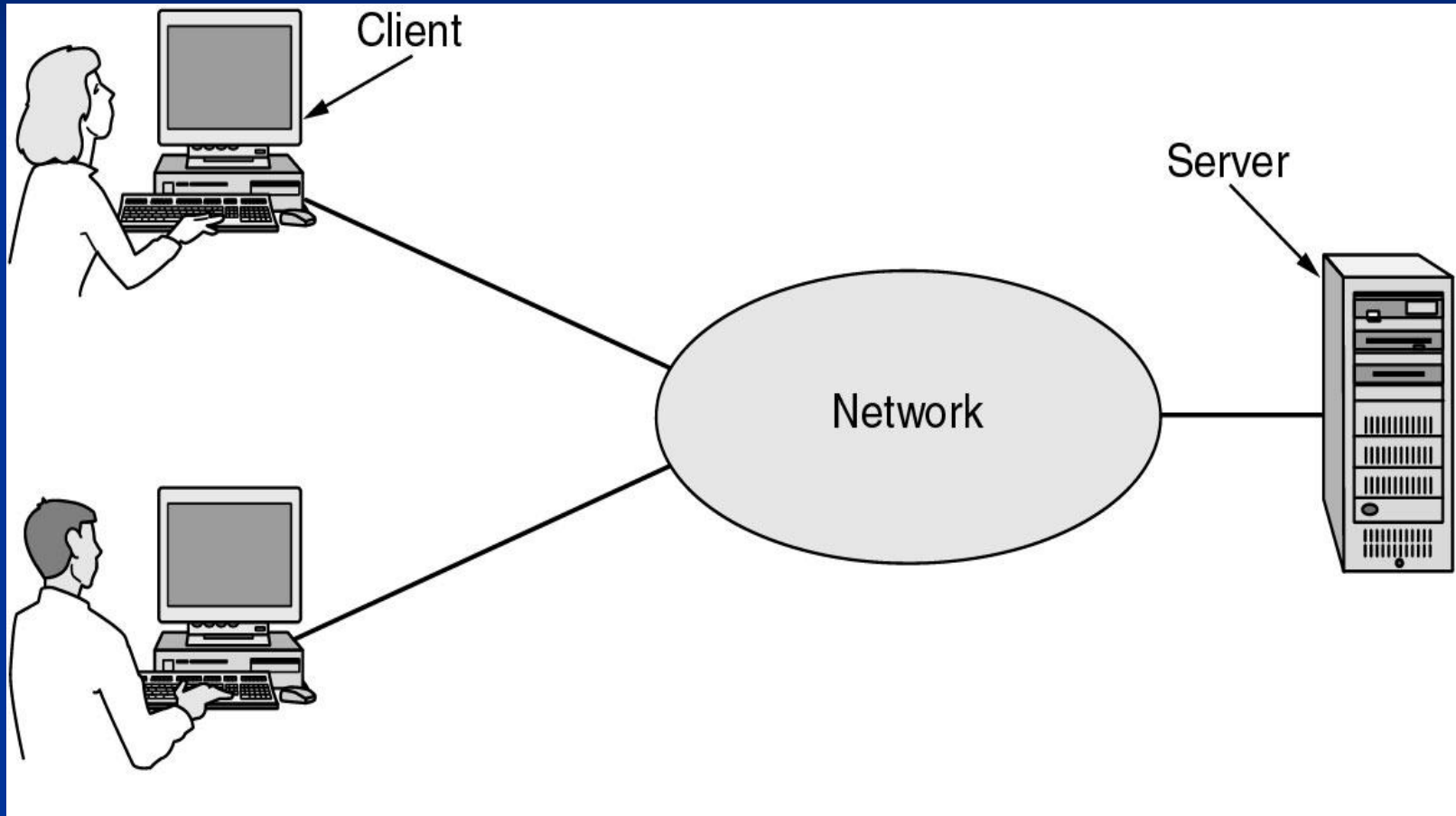
Sameer

Client- Server Model

Example

Both Nancy and Sameer works for Company X. Nancy wants to access some data about the employees who works at New Delhi. In this case the data is stored on Powerful Computers called Servers.
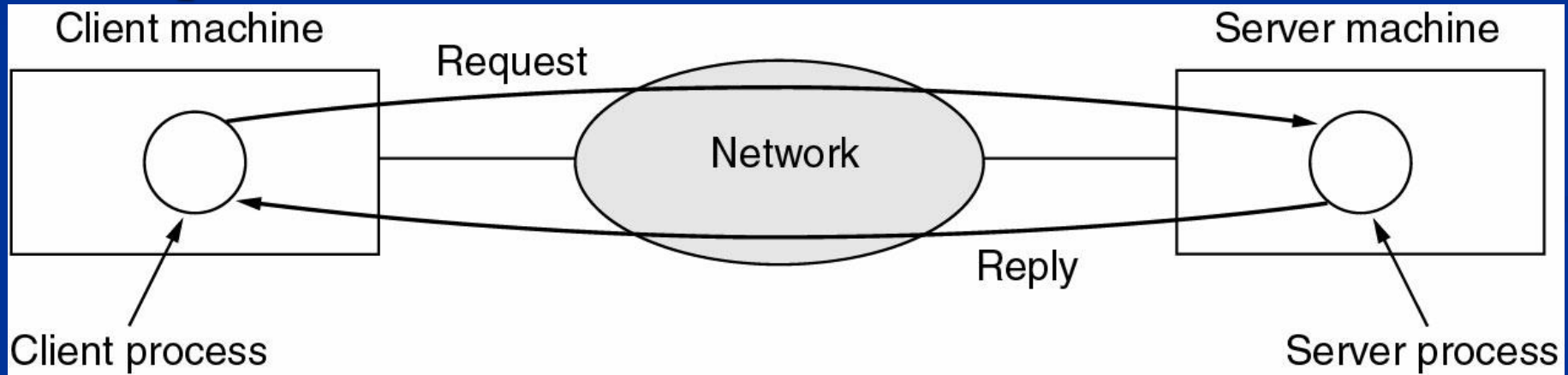
SERVER maintains all the database.

Employee uses CLIENT to access remote data.

This whole arrangement is called Client Server Model

Business Applications of Networks (2)

- The client-server model involves requests and replies.

Client machine — Request — Network — Server machine — Reply

Client process — Server process

Business Applications of Networks(3)

Computer Network provide POWERFUL

- **Communication Medium**

    - e-mail

    - Videoconferencing

    - e-commerce/ online shopping
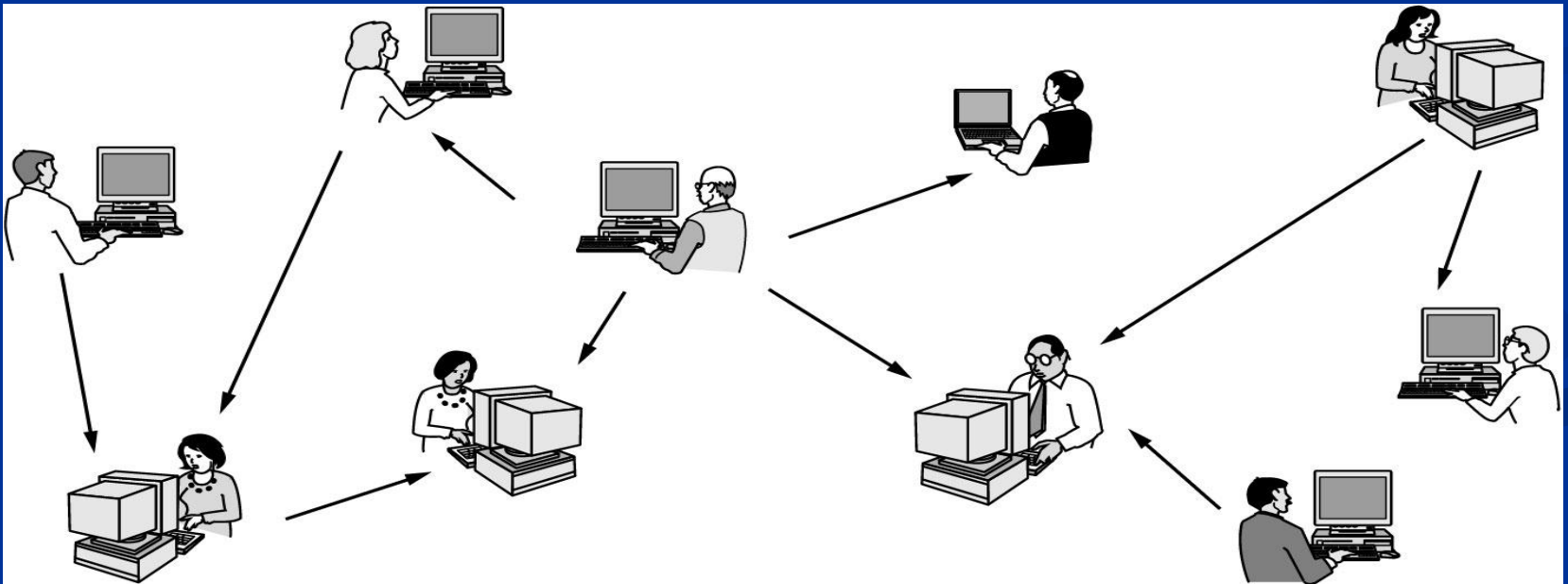
(B) <u>Home Network Applications</u>

Why do people buy computers for home use?

Initially for word processing & Gaming, but **<u>Biggest reason is Internet Access</u>**

- Access to remote information
  - Surfing eBooks, filing tax, sports, travel etc
  - This all implies interaction between a person and remote database full of information

- Electronic commerce

- Person-to-person communication like chat rooms, Blogs etc

- Interactive entertainment like video on demand.

Home Network Applications (2)

- **Person-to-person communication**
    - Email
    - Chatting, video calling, internet calls
    - Another person to person communication goes by the name Peer-to-Peer Communication . In this system there are no fixed clients and servers

Home Network Applications (3)

■ Some forms of e-commerce.

Tag	Full name	Example
B2C	Business-to-consumer	Ordering books on-line
B2B	Business-to-business	Car manufacturer ordering tires from supplier
G2C	Government-to-consumer	Government distributing tax forms electronically
C2C	Consumer-to-consumer	Auctioning second-hand products on-line
P2P	Peer-to-peer	File sharing

(C)Mobile Network Users

Wireless	Mobile	Applications
No	No	Desktop computers in offices
No	Yes	A notebook computer used in a hotel room
Yes	No	Networks in older, unwired buildings
Yes	Yes	Portable office; PDA for store inventory

- Why would anyone want wireless networks? (Common reason is **Portable Offices**)
- Combinations of fixed wireless networks and mobile wireless computing.

PDA's stand for Personal Digital Assistants,

(D) <u>Network Hardware</u>

- **There are two important dimensions which stand into which all computer networks fit**
    - Transmission Technology
    - Scale.