



Local Area Networking

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By

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LAN Issues

- Local Area Networks evolved from stand-alone PCs
- Control and safety features found commonly in multi-user systems were implemented much later in LANs
- LANs were mainly implemented for sharing expensive resources like line printers, huge storage disks, etc.
- Users are more worried about getting resources than about the access control issues



LAN Issues

- Audit trails are not considered until a problem occurs
- Whether documentation is usually not complete
- Whether necessary controls and safety measures have been implemented and followed
- Whether software is installed properly and the required parameters are set properly
- Whether the appropriate technology is being used



LAN Risks

- Violation of licenses due to usage of unlicensed software.
- Users can easily access confidential information
- Loss of data and program integrity
- Improper disclosure of data due to general access policies rather than a “need to know” policy
- Virus infection
- Destruction of audit trail
- Potential public access through dial-up access facility



LAN Security

- By enforcing User ID / password conventions
- By implementing record and file locking to prevent simultaneous update
- By ordering ownership of files, programs, and directories
- By providing access on a “need to know” basis only.



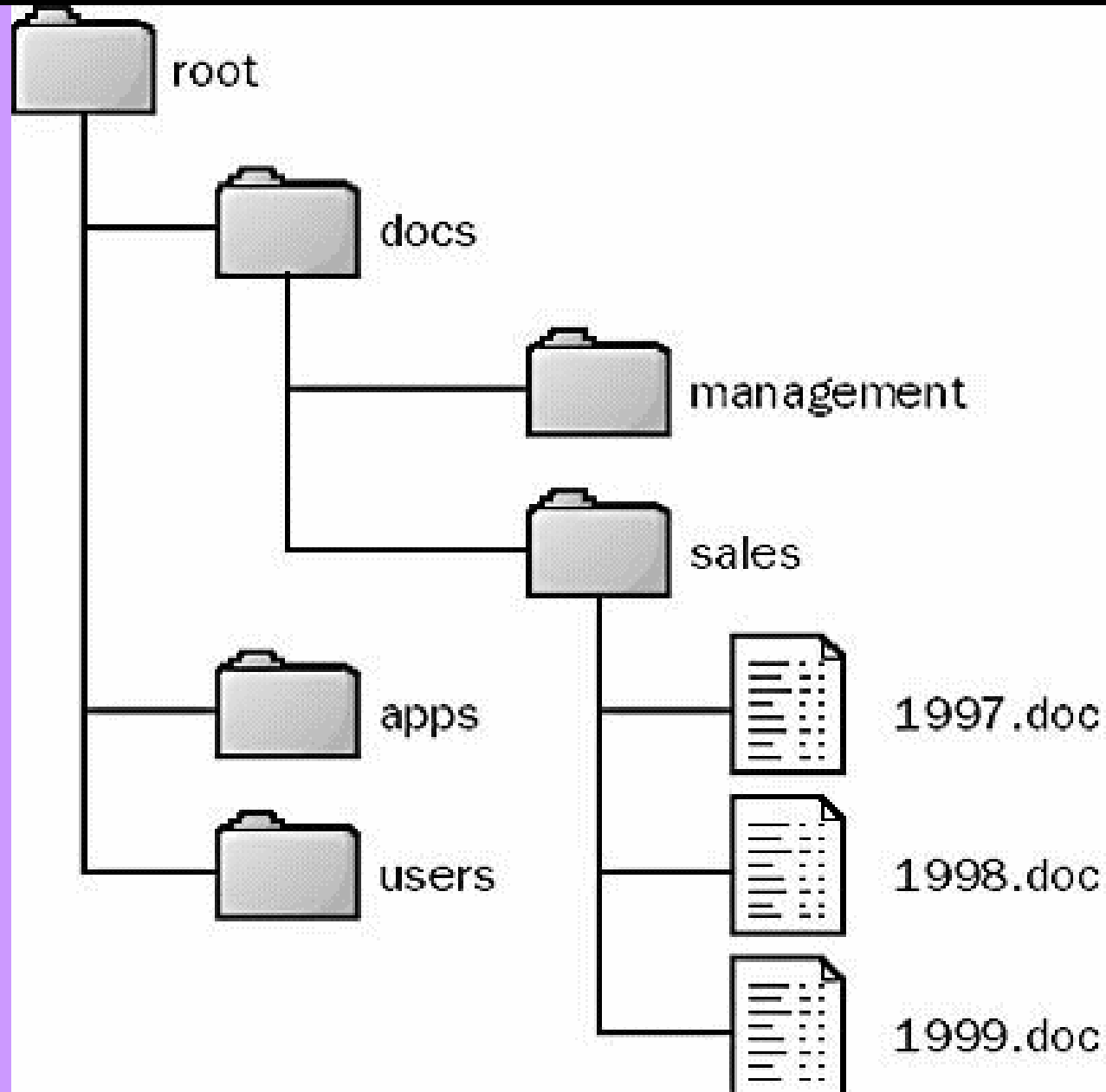
LAN Security Guidelines

Access Controls

- Access to directories
- Trustee rights
- File Attributes
- Account restrictions
- Backup and recovery
- Dial-up access



LAN File System



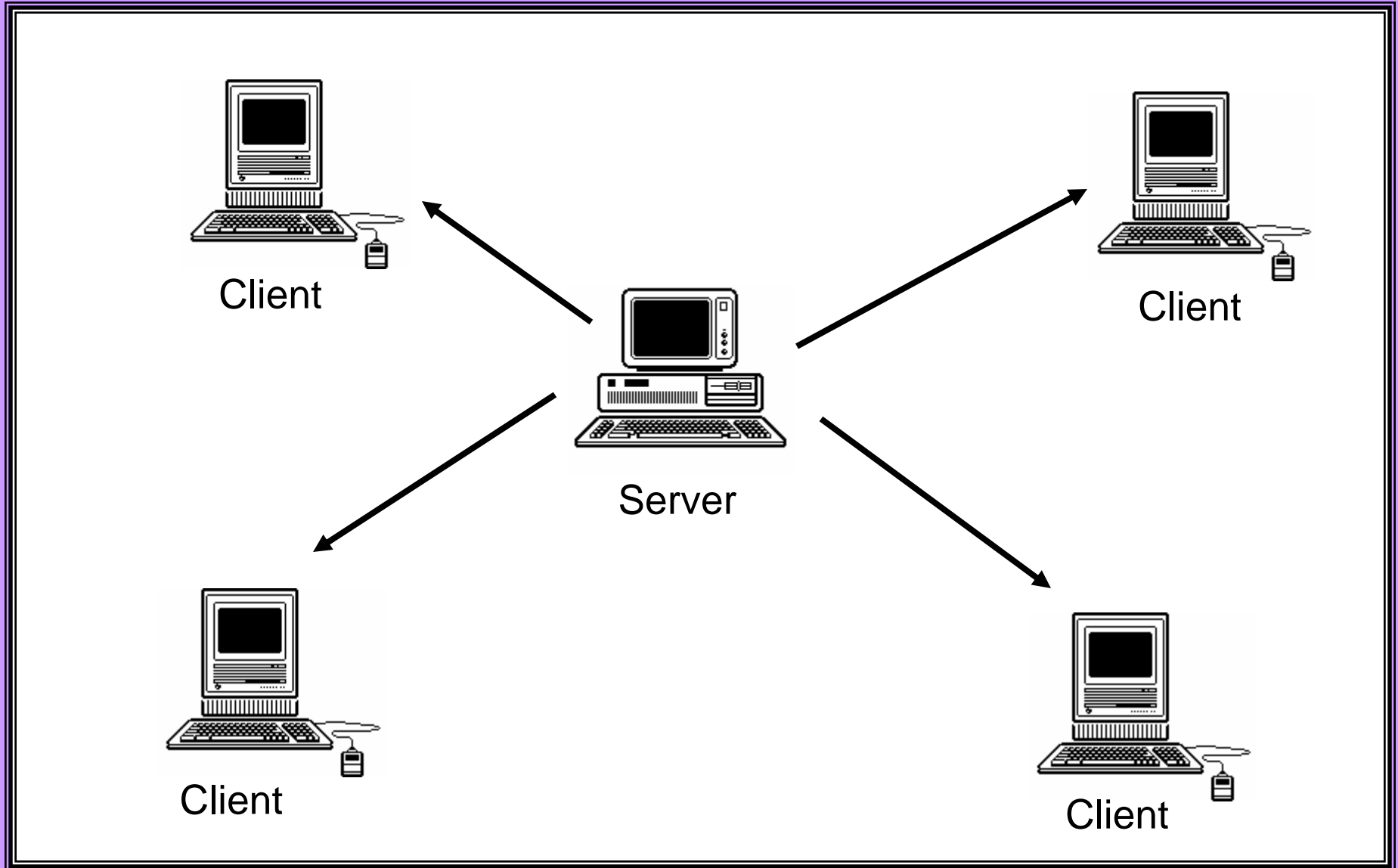


Computing Evolution

- ⊗ Mainframes
- ⊗ Minicomputers
- ⊗ Microcomputers or stand-alone PCs
- ⊗ PCs networked with each other - Peer-to-Peer
- ⊗ PCs networked with a simple File Server
- ⊗ PCs networked with a powerful Server
- ⊗ Fat-client Fat-server architecture
- ⊗ Thin-client Fat-server architecture



Client Server Networking





Client Server Model of Computing

Client - The user point-of-entry for the required function. Normally a desktop computer, workstation, or a laptop computer; the user generally interacts directly only with the client.

Server - A computer that satisfies some or all of a user's request for data and/or functionality, such as storing or processing shared data and performing back-end functions not visible to users, such as managing peripheral devices and controlling access to shared databases.

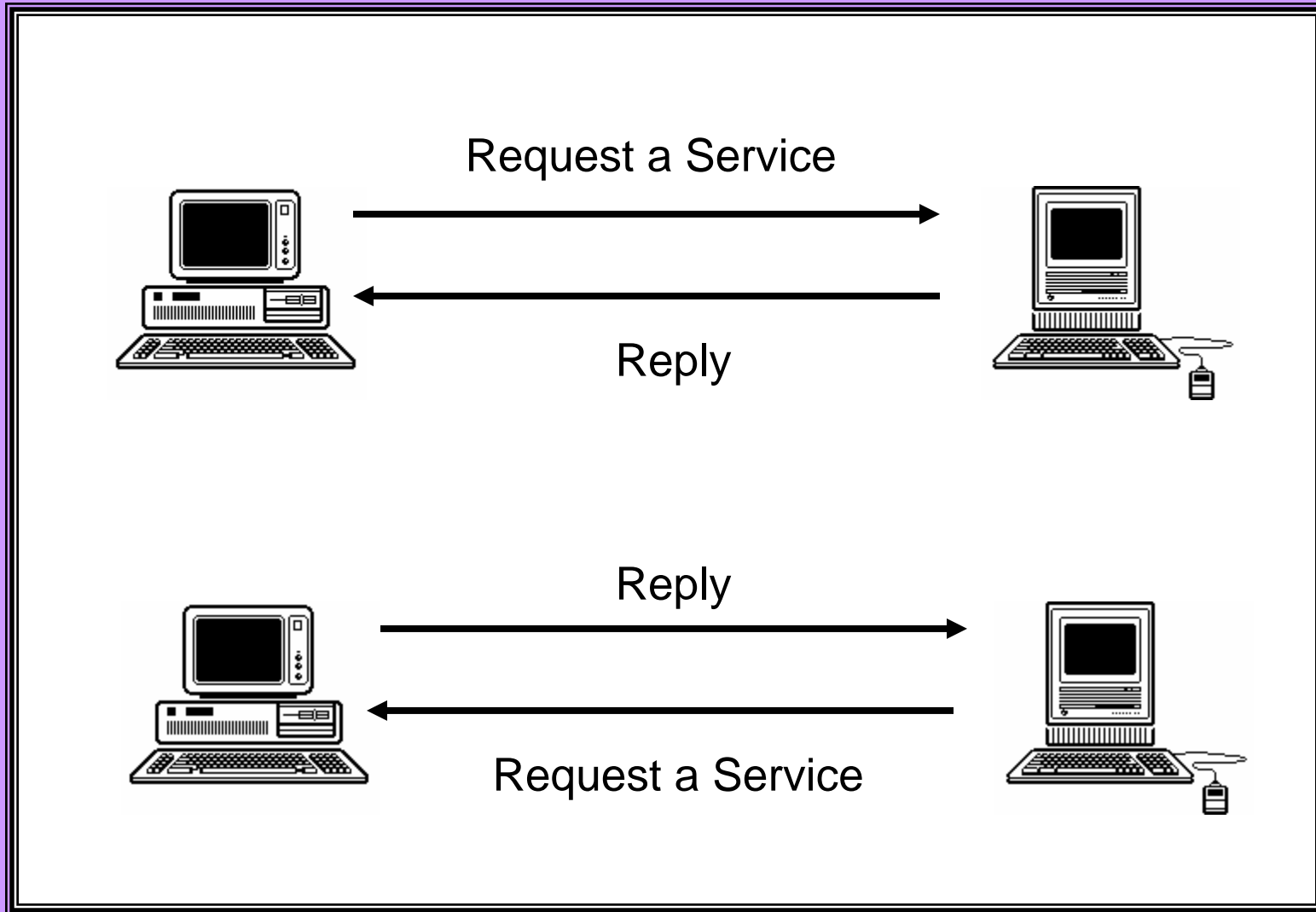


Why Client Server

- ✓ Improving the flow of management information
- ✓ Better service to end-user departments
- ✓ Lowering IT costs
- ✓ Direct access to required data
- ✓ Higher flexibility of information processing
- ✓ Direct control of operating system
- ✓ Better utilization of existing resources



Peer to Peer Networking





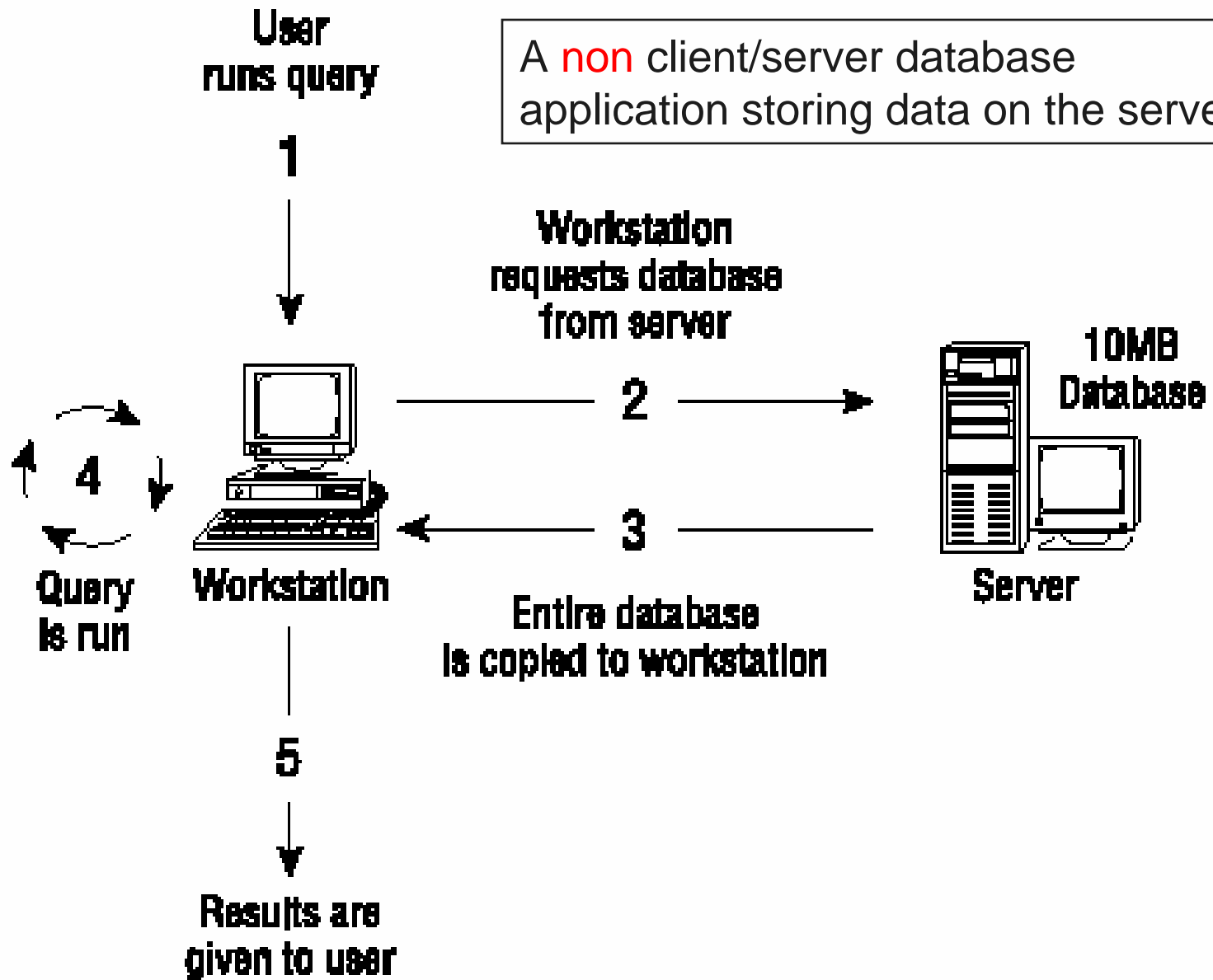
Client Server Characteristics

- ॐ Consists of a client process and a server process
- ॐ Client and server can be different systems
- ॐ Client or server can be upgraded independently
- ॐ In some systems, clients can access multiple servers
- ॐ Networking is a must
- ॐ Significant amount of application logic is on client
- ॐ Action is usually initiated by the client
- ॐ Clients generally have a Graphical User Interface
- ॐ Most CS systems have a querying (SQL) capability
- ॐ The database should provide for data security



DBMS - Non Client-Server

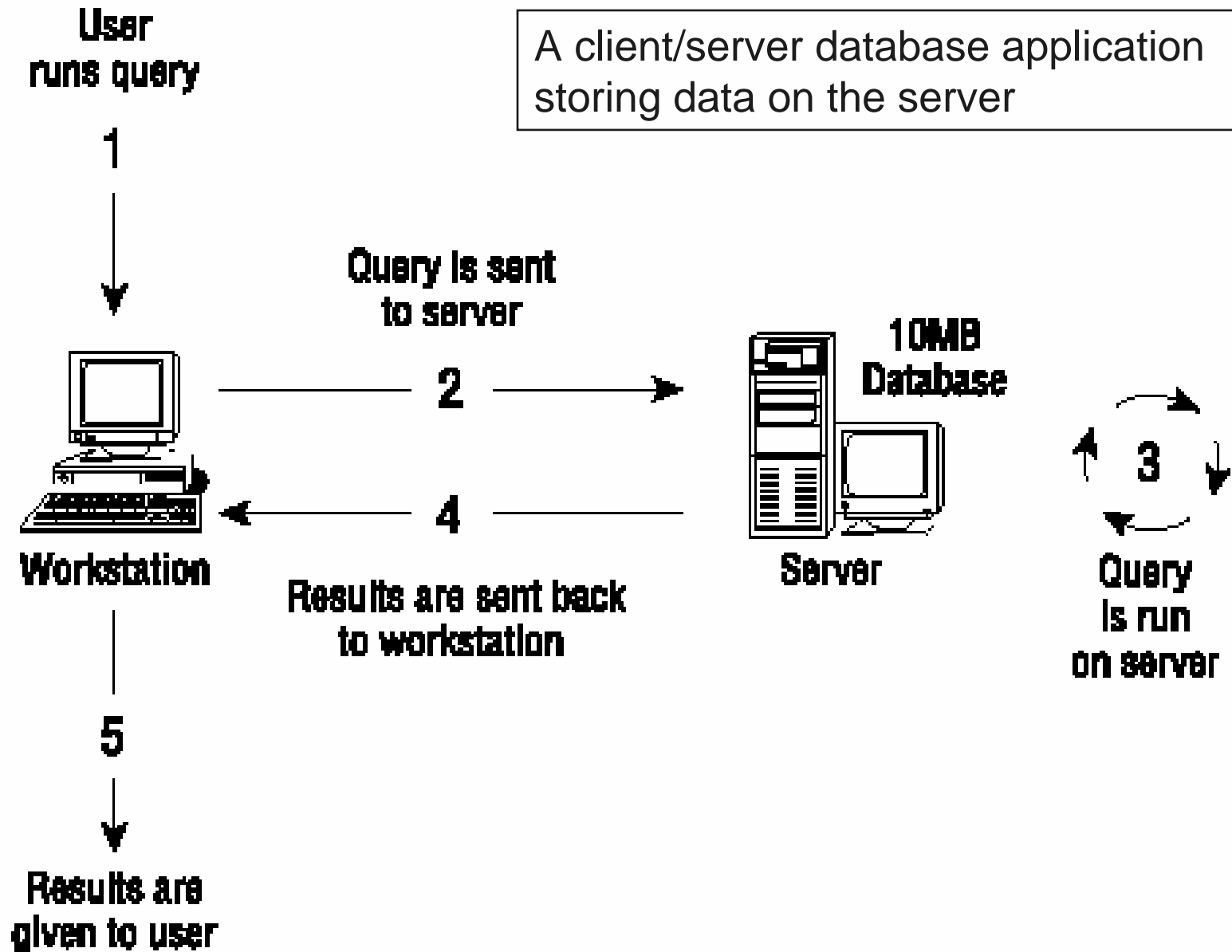
A **non** client/server database application storing data on the server

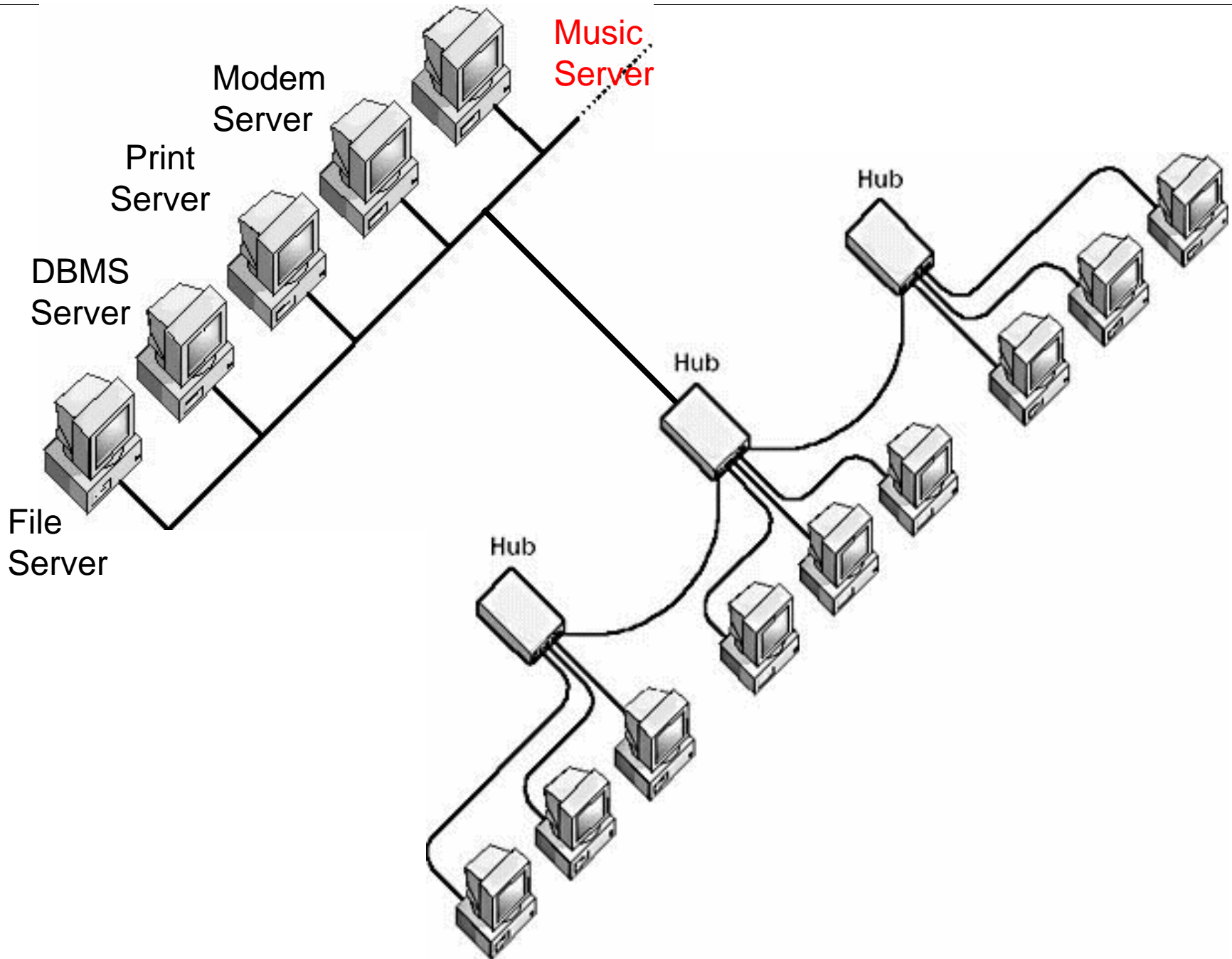




DBMS - Client-Server

A client/server database application storing data on the server





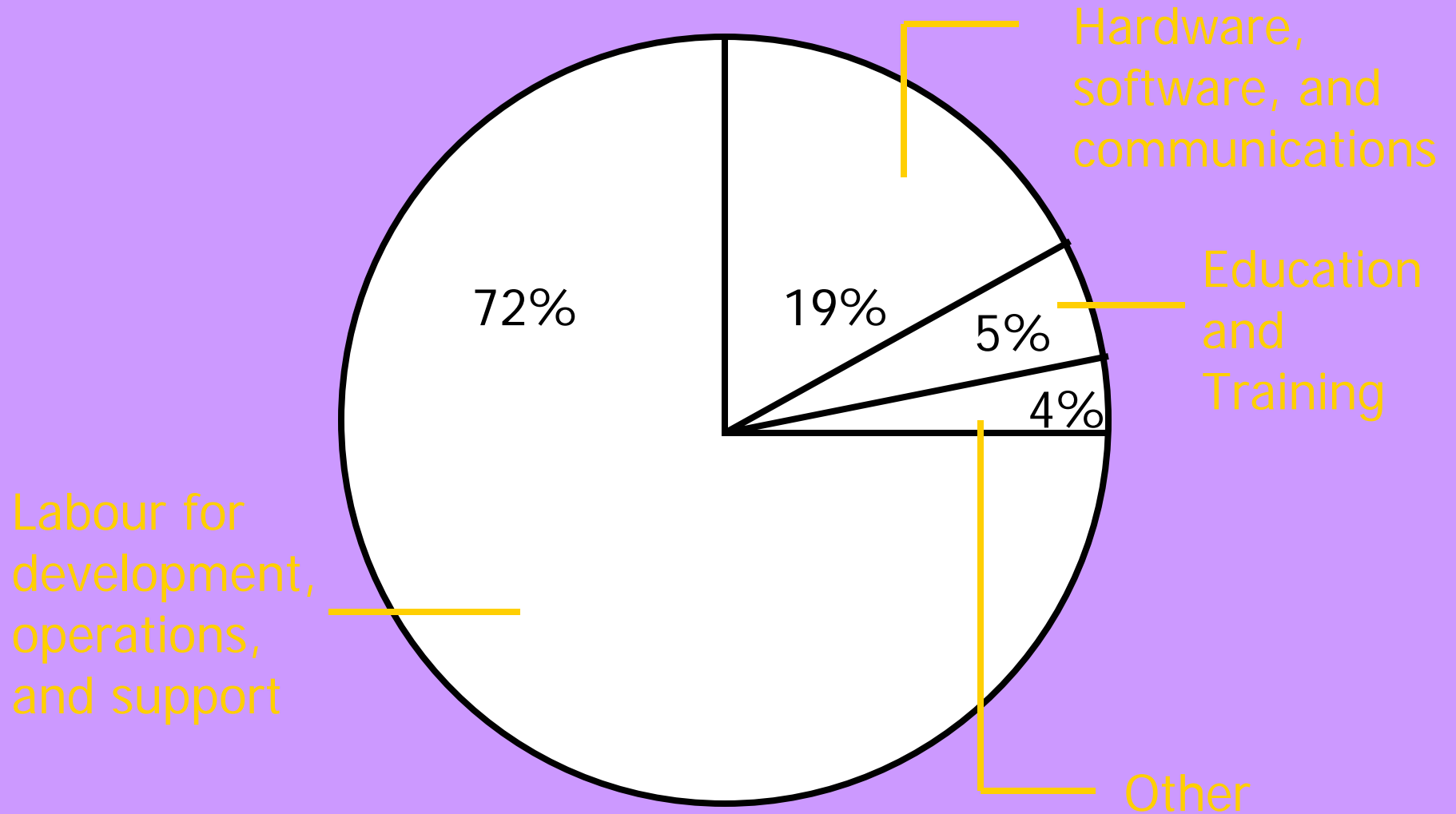


Client Server Implementation Risks

- ☯ Technological Risks
- ☯ Operational Risks
- ☯ Economic Risks
- ☯ Political Risks



Client Server Budget Breakdown





Top Network Mistakes

- ☯ Turning off the server while users are logged in
- ☯ Deleting important files from the server
- ☯ Copying a file from the server, changing it, and copying it back
- ☯ Sending something to the printer again because it didn't print the first time
- ☯ Unplugging a cable while the computer is on
- ☯ Assuming the server is safely backed up
- ☯ Thinking you can't work because the network is down



Network Monitoring

Some situations which need an operator's intervention:

- ✧ Consumption of storage space by the message queues
- ✧ Illegal termination of the program
- ✧ Identification of illegal messages on the line
- ✧ Failure of the communication line
- ✧ Fault in the cables used for networking



Network Control Terminals

Functions of a Network Control Terminal:

- ✦ Administering the network activity levels
- ✦ Changing the queue lengths
- ✦ Exploring the data crossing a communications line
- ✦ Generating system statistics
- ✦ Increasing backup frequency
- ✦ Questioning system status
- ✦ Sending warning messages
- ✦ Starting and terminating communication lines



Monitoring Tools

- ➔ Downtime reports
- ➔ Help Desk Reports
- ➔ On-Line Monitors
- ➔ Response time reports



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Thank You

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