cis3.5 spring2009 lecture II.1

topics:

- today we will cover internet basics and what you need to know about interactive web programming

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what is a network?

- when computers talk to each other, this is called a **network**
- the network can have different kinds of computers and peripherals attached to it
- networks in which computers are physically connected to each other in the close geographical proximity are called **local area networks** (LANs)
- other networks are called **wide area networks** (WANs)
- the **internet** is a wide area network
- the internet is an *open system* = "a system whose architecture is not a secret"
- *protocol* = set of rules for how computers communicate with each other; for example:
  - TCP: transmission control protocol (computer ↔ computer)
  - IP: internet protocol (computer ↔ computer)
  - HTTP: hypertext transfer protocol (computer ↔ browser)
  - FTP: file transfer protocol (computer ↔ computer)

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what is the internet?

- history
  - ARPAnet (circa 1971): used "NCP"
  - TCP (1974): hardware independent, open
  - internet was standardized in September 1981
- the internet is NOT the world-wide web (WWW)
  - the idea of the world-wide web was conceived by Tim Berners-Lee
  - developed and discussed at CERN in Switzerland from about 1989
  - made public in 1994
  - the WWW uses the internet, but is not the internet itself—it is a way of organizing and viewing data that is accessible through the internet

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some internet facilities

- the world wide web
  - HTML = hypertext markup language
  - *hyperlink*
  - *browser*
  - *web page*, *web site*, *web server*
- ftp (file transfer protocol)
  - *download*
  - *upload*
- email
- newsgroups
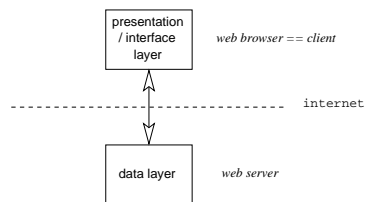 - *posting*
  - *thread*
- mailing lists

clients and servers

- *server*:
  - computer on a network which carries out some **service** for another computer
- *client*:
  - the other computer for whom the server is carrying out the service
- types of servers:
  - *file server*
    - ∗ provides files for clients
  - *database server*
    - ∗ specialized file server that provides databases (structured files) for clients
  - *web server*
    - ∗ specialized file server that provides files that make up the components of a web site,
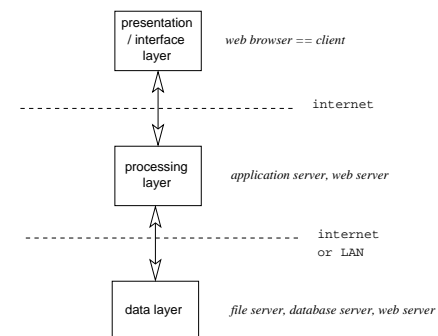   - ∗ for example: HTML documents, CSS files, images, video clips, etc.

- *groupware server*
  - ∗ manages scheduling for individuals and groups of co-workers/collaborators
  - ∗ provides reports (e.g., billing) for collaborators
  - ∗ supports mailing lists for collaborators
  - ∗ e.g., Lotus Notes
- *mail server*
  - ∗ sends mail
  - ∗ receives mail
  - ∗ stores mail
- *application server*
  - ∗ provides access to particular applications
  - ∗ e.g., game server

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client-server architectures

- two-tier architecture

presentation / interface layer   *web browser == client*

internet

data layer   *web server*

- three-tier architecture

presentation / interface layer   *web browser == client*

internet

processing layer   *application server, web server*

internet or LAN

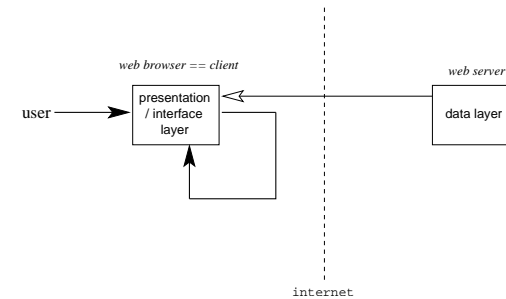data layer   *file server, database server, web server*
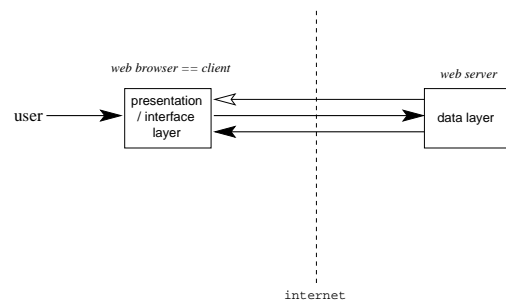
• advantages of client-server architecures:

  – isolates data storage technology

  – places more burden on server (instead of client)

  – distributes tasks amongst server(s)

  – follows object-oriented and modular programming paradigms

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interactive web programming

• user initiates some action

• which causes the web page to change in some way

• changes can happen locally, on the "client"

• changes can happen on the server and be reflected on the client

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examples of interactive web programming

• *Processing*

  – language written for artists

  – changes happen locally, on the client

• *Many Eyes*

  – data visualization software

  – changes happen on the server and are reflected on the client