CS1007 lecture #15 notes

tue 29 oct 2002

- news
- networks
- applets
- GUIs
- reading: ch 8.1-8.4

networks (1).

- two or more computers connected to each other
- networked computers can share information
- and resources, e.g.:
  - printer
  - file server
- example: CUNIX system
- connections:
  - *point-to-point* — computers are directly connected to each other
    - message speed is fast
    - adding computers is expensive
  - single communication line
    - message speed can be slow
    - adding computers is cheap

networks (2).

- *network address*
  - uniquely identifies each computer on the network
- *packet*
  - long messages are split into pieces
  - each piece is a packet, sent individually along the network
  - improves message speed
- *local-area network* (LAN)
  - designed to span short distances
- *wide-area network* (WAN)
  - designed to span longer distances
  - connects multiple LANs

networks (3).

- the *Internet*
  - developed in the 1970s as ARPANET
  - the ultimate WAN — a network of networks
- *protocol*
  - set of rules governing communication
  - TCP/IP (transmission control protocol / internet protocol)
- IP address = network address on the Internet
  - numeric, e.g., 204.192.116.2
  - also have text equivalents called *Internet addresses*, which are comprised of local computer names (i.e., name of computer on LAN) plus domain names (i.e., name of LAN on WAN)
  - domain names are controlled by the Internet Naming Authority
- *domain name system* (DNS)
  - translates between IP address and Internet address

networks (4).

- the *World Wide Web* (WWW)
- provides standard method of interfacing to the Internet from the user level
- uses *hypertext*
  - non-linear method of organizing information
  - refers only to textual information
- *hypermedia*
  - refers to non-textual information, such as sound, video and graphics
- *browser*
  - user program that provides method of viewing WWW documents
  - early browsers included: Archie, Gopher
  - *Mosiac*
    - first graphical WWW browser
    - released in 1993
    - became Netscape

networks (5).

- *HyperText Markup Language* (HTML)
  - standard format for WWW documents
- *Uniform Resource Locator* (URL)
  - unique document address on the WWW
- *HypterText Transfer Protocol* (http)
  - protocol used for transfering HTML documents
  - provides *one-way* transfer from *server* to *client*
- other protocols include: ftp, telnet
  - these provide *two-way* transfer between *server* and *client*
- Java
  - grew out of the above
  - allows *two-way* transfer
  - text, graphics, sound

networks (6).

- *client-server* architecture
- comes from operating system design
- methodology by which tasks are divided onto different processors according to functionality
- programs can be divided into:
  - computation portion
  - drawing or output portion
- each portion can be executed on a different CPU
- X windows
  - windowing system used under UNIX
  - with X windows, the drawing is done on the *client*, although the execution may be happening on a different physical machine, the *server*

applets (1).

- Java programs can run as *applications* or *applets*
- *application:*
  - executed using the *java* command
  - server and client can be the same machine or different machines
  - client invokes JVM which interprets classes and runs them
- *applet:*
  - must be executed using a browser, like Netscape, or the *appletviewer* command
  - server sends applet to the client, in the form of class files; applet invokes JVM which interprets classes and runs them on the client
  - there are two parts:
    - an HTML file used to invoke the applet
    - Java class file(s) that contain the applet code

applets (2).

- file name = hi.html

```
<html>
<title>
sample applet page
</title>

the applet will be shown below...

<applet code="hi.class" width=400 height=400>
</applet>

</html>
```

applets (3).

- file name = hi.java

```
import java.awt.*;
import java.applet.Applet;

public class hi extends Applet {

  public void paint( Graphics g ) {

    g.drawString( "hi",10,10 );

  } // end of paint()

} // end of class hi
```

applets (4).

- `java.awt` package
  - *Abstract Windowing Toolkit* (AWT)
  - classes that support graphical user interfaces (GUI)
  - includes `java.awt.Component` method:
    - `public void paint()`
- `java.applet.Applet` class
  - `public void init()`
  - `public void start()`
  - `public void stop()`

GUIs (1).

- Graphical User Interface
- topics:
  - components
  - containers
  - layout managers
  - events
  - listeners

GUIs (2).

- *components*
- a component is a building block of any GUI
- here are some examples:
  - Label
  - TextField, TextArea
  - PushButton
  - CheckBox
  - RadioButton
  - ComboBox
  - List
  - PulldownMenu
  - ... and many more!!

GUIs (3).

- *containers*
- a container is a special component that can hold other components
- here are some examples:
  - Applet
  - Frame
  - Panel

GUIs (4).

- *layout managers*
- a layout manager describes where the components are laid out within a given container
- you need to “set” the layout manager for each container
- you can “nest” containers (and their layour managers)
- `BorderLayout` — simplest layout manager
- looks like this:

<table>
<tr><td colspan="3">north</td></tr>
<tr><td>west</td><td>center</td><td>east</td></tr>
<tr><td colspan="3">south</td></tr>
</table>