Lecture 3 – The Internet, The Web & Office Suites

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Objectives

- Refresher
- Brief introduction to Internet internals
- How the World Wide Web works
- Introduction to Office Suites
- Office Suite feature sets

- Today's practical
  - Internet Explorer and search engines

Refresher

- Aims
  - To gain competency in common packages
  - To understand how & how not to use packages
- So far
  - E-mail, Operating Systems, Word Processing
- Today
  - The Internet and Internet Explorer
  - Introduction to Office Suites
- Next Week
  - Mark Up Languages

What is the Internet?

- A network of networks
- Individual computers are connected to a network
  - Ethernet, token ring, PPP etc.
- Networks are linked by routers
  - Switching devices with more than one network interface
  - Network interfaces may be of different types
- The internet is based on TCP/IP
  - A two layer, packet based communications protocol
  - IP (Internet Protocol) works across one network (1 “hop”)
  - TCP (Transmission Control Protocol) manages the end-to-end communication (multiple hops)

Features of TCP/IP

- IP delivers one packet of data
  - 1 to a few thousand bytes
  - No inherent “meaning” to the data, just some bytes
  - Unreliable service, no guarantee of delivery or ordering
- TCP adds additional features
  - Works on a byte stream (packets now “invisible”)
  - Ensures delivery in correct order (or failure notification)
  - Maintains connection
  - Provides routing and flow control

So What Can We Do With It?

- We can reliably send a stream of data from one computer to any other on the Internet
- It is up to the applications running on each computer what that data “means”

What does this Java code do?

```
Public static void main(String args[]) throws Exception {
                for (Object o3, o4, o2 = new
  ServerSocket(80), o1 = null; true;
 ((Socket)(o1 =
  ((ServerSocket)o2).accept())).getOutputStream().write((
  "HTTP/1.0 200 OK\n\n" + new String((((new
  FileInputStream(((File)(o4 = new File(new
  StringTokenizer((new BufferedReader(new
  InputStreamReader(((Socket)o1).getInputStream()))))).rea
  dLine().substring(4)).nextToken())))).read((byte[])(o3
  = new byte[(int)((File)o4).length()]), 0, (int)
  ((File)o4).length()) == 0) || true) ? ((byte[])o3) :
  ((byte[])o3)))).getBytes()),
  ((Socket)o1).getOutputStream().flush(),
  ((Socket)o1).close());
 }
```

The HTTP Protocol

- HTTP - Hypertext Transfer Protocol
  - Text based, transaction oriented protocol
  - Transfers “typed” data between a server and a client
- Simple to implement - E.g.
  - `GET /index.html HTTP/1.0`
  - ```
    HTTP/1.0 200 OK
    Date: Sun, 24 Feb 2002 23:55:43 GMT
    Content-Type: text/html
    Content-Length: 2334
    [blank line]
    <HTML><HEAD><TITLE>Some webpage</TITLE>
    [rest of file.....]
    ```
    ```

The HTML Language

- HTML - Hypertext Markup Language
  - Text based language
  - Combines content, formatting and semantic markup
  - Can be enormously complicated to render
    - Where on the screen should we display an image in a cell in a table inside another table inside a frame where all dimensions are relative (given as percentages) ?

HTTP & HTML work together

- HTTP can transfer many types of data
  - Type is given by MIME (Multi-purpose *I*nternet Mail Extensions)
- HTML is one type of data that can be transferred over HTTP
- Other common types are GIF, JPEG, PDF
- The *server* delivers the HTML
- The *browser* renders (displays) the HTML

Internet Terminology

- "Internet" and "Web" are often used interchangeably
  - Does this matter?
- Intranet - internal (local) web
- Extranet - Limited web sharing
- VPN - Virtual Private Network
  - Allows secure, roaming connection to an internal network (also known as "tunnelling")

Web Searching

- Be aware of the differences, benefits and pitfalls with:
  - Keyword based web search engines
    - Google, Yahoo
  - Web directories
    - Yahoo, Open Directory Project
  - Natural language query engines
    - Ask Jeeves

Office Suites

- Common components
  - Word processor
  - Spreadsheet
  - Presentation Package
- Optional components
  - Graphics
  - Databases
  - Web page editors

Office Suite Integration

- How integrated are Office Suites?
  - Common “look and feel” (F7 = spell check)
  - Common sub-components (Charting, Equations)
  - Embeddable in each other (or in an overall document)
  - Shared text & drawing “styles” (Heading1, normal)
  - Shared “metadata” (insertable fields)
  - Common automation language (macros)

Office Suite Feature Sets

- Most documents are small, inconsistently formatted, and manually laid out
- Most spreadsheets contain no formulae more complicated than basic arithmetic
- Most presentations look like this one
- Hardly anyone develops databases in office suites, and then only for address lists
- Most people lack the both the technical knowledge and the artistic skill to use a graphics package
- Most web page editors have never been used for more than a simple “Hi, my name is David” homepage that was never published

Have You Ever?

- Written a VBA program for Word?
- Used a Pivot Table in Excel?
- Put an action button in a Powerpoint Presentation?
- Created a relation between two tables in Access?
- Been told something useful by the Office Assistant?

Why are these features here?

Because…

- Development teams are expensive to maintain
- Customers buy a one-off “licence to use”
- Customers do not expect to pay for bug fixes
  - Therefore fixing bugs will not generate revenue
- Revenue can only be generated through new releases
- Support for old releases must end
- New releases must have new features
  - Otherwise, why buy them?
- Therefore, there will always be new features

Some alternatives…

- **Software is provided "free"**
  - Money is made from training, consultancy and services
- **Software is rented, not purchased**
  - Revenue stream is smoother
  - Incentive to retain customers by fixing bugs and making useful improvements
- **Software is paid for by usage**
  - Incentive is to give customers genuinely useful products

We will examine these issues in more detail in a later lecture…

Next Week

- Mark Up Languages
  - What are they?
  - History
  - Where are they going?
  - Why are they relevant to office suites?
- Practical on Microsoft Word