The History of Internet

1970 - Advanced Research Agency Network (**ARPANET**) hosts started to use Network Control Protocol (**NCP**).

1972 - The first Telnet specification, "Ad hoc Telnet Protocol" was submitted as RFC 318 (**RFC**-Request for Comments).

1973 - RFC-454, "File Transfer Protocol", was introduced.

1974 - The Transmission Control Program (**TCP**) was specified in detail.

1981 - The **IP** (Internet Protocol) standard was published in RFC 791.

The History of Internet

1982 - Control Protocol (TCP) and Internet Protocol (IP) as the **TCP/IP protocol suite**.

1983 - ARPANET switched from NCP to TCP/IP.

1984 - Domain Name System (**DNS**) was introduced.

1986 - The U.S. National Science Foundation (**NSF**) initiated the development of the **NSFnet**, which even now provides a major backbone communication service for the Internet

The History of Internet

1989 - The web was initially conceived and created by **Tim Berners-Lee**, a computer specialist from the European Particle Physics Laboratory (CERN) in **1989**. He and his partner Robert Cailliau created a prototype web for CERN and released it to the Internet community for testing and comments.

1991 - NSF dropped its funding of the Internet and lifted the ban on commercial traffic on its backbone.

The History of Internet

Note: You should recognize that an IP address is, in fact, an Internet protocol address.

* The survey says that 4,294,967,296 possible IP addresses are available on the Internet.

**Today, the NSFnet backbone carries over 12 billion packets of information per month.

***   Up until 1991, all NSF traffic came from government and educational institutions

The History of Internet

- The most important technological development in the history of the web, besides the creation of the web itself, was the development of **graphical browsers** in the early **90s**. Beginning with NCSA's **Mosaic** and its evolution into Netscape's Navigator and **M**icro**S**oft's **I**nternet **E**xplorer, these programs allowed users to browse the resources on the web in an extremely user friendly environment.

- This made the web a "fun" place and marked the beginning of the true web revolution.

The History of Internet

After 1991,

- Commercial enterprises could respond more quickly to the market and to demand for information.

- New commercial backbones are built and of course, the marketing and popularization of the Internet came.

- The Net started to move away from UNIX and other science application languages to Windows-based interfaces that were easy for the public to use.

- As the Internet became more accessible, companies began to see the enormous potential for business on the Internet. In addition, users also began to see some of the incredible applications for which they could use the Internet.

Terms

Protocol: A protocol is nothing more than **a set of rules**. On the Internet, it is a set of rules computers use to communicate across networks. As long as everyone follows the rules, communication can occur freely

Backbone: A backbone is nothing more than **a major cable** that carries network traffic. Although thousands of regional private and public networks exist, most Internet traffic spends most of its trip on one of the major backbones

TCP/IP is a set of protocols developed to allow cooperating computers to share resources across a network. Today TCP/IP is the most important protocol that internet is based on.

Transmission Control Protocol/Internet Protocol

The Primary Advantages of the TCP/IP

1. It is the most complete and accepted **enterprise networking protocol** available today.

2. All **modern operating systems** offer TCP/IP support.

3. Most large networks rely on TCP/IP for much of their network traffic.

4. TCP/IP is also the protocol standard for the Internet.

5. Using TCP/IP technology is the ability to connect *dissimilar systems*.

What exactly is the web?

- The web is a complex, international, cross platform, cross language, cross cultural mesh of servers, clients, users, databases, and quite a few artificial intelligences all talking, working, searching, viewing, accessing, downloading, and who knows what else.
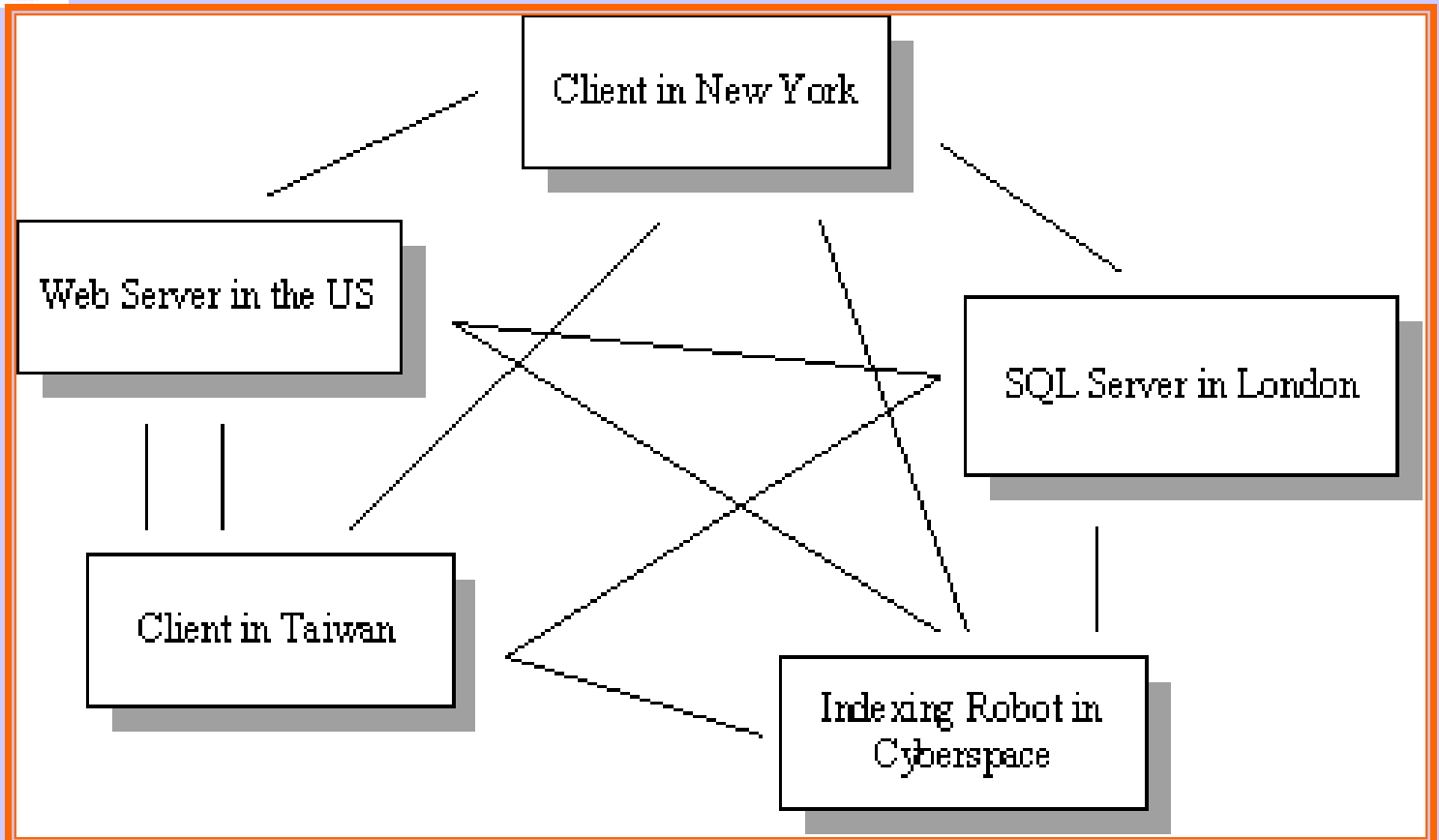
What exactly is the web?

- As such, no one owns or controls the web. In fact, it is impossible to own or control by its very nature and design. In fact, "it" is not even an "it". You can't hold the web or make it tangible. Instead, you can think of the web not as a thing, but as a process, an action, a medium of communication.

- *This fact has profound implications on how you should think about designing web pages.* For example, give up any hopes of maintaining intellectual property over what you distribute on the web and know that the only information that is private or secure is the information that is stored solely in your own neurons.

What exactly is the web?

- "The Internet" is quite a different thing from "an **Intranet**".

- An **Intranet** is a mini web that is limited to the users, machines, and software programs of a specific organization, usually a company. Since organizations are typically small and have more control over policies and information systems, intranets are often more controllable.

What exactly is the web?

- So how do all these computers, software packages, and people communicate with each other?

- The creators of the web devised standards of communication upon which the web is built.

- These standards sit at a layer above operating systems, computer languages, or Internet transmission protocols and provide a basic medium for communication.

What exactly is the web?

- The two most important standards (protocols) used on the web today are HTTP and HTML. Let's look at each of those protocols more in depth...

- The web is the largest client/server system implemented to date." It is also the most complex and heterogeneous one that must deal with multitudes of operating systems, human languages, programming languages, software, hardware, and middleware.

What is a client/server system?

- A **client/server system** is a very keen way of distributing information across information systems like a local area network (LAN), a wide area network (WAN), or the Internet.

- A **client/server system** works something like this:
  - ✓ A big hunk of computer (called a server) sits in some office somewhere with a bunch of files that people might want access to.
  - ✓ This computer runs a software package (also called a server) that listens all day long to requests over the wires.
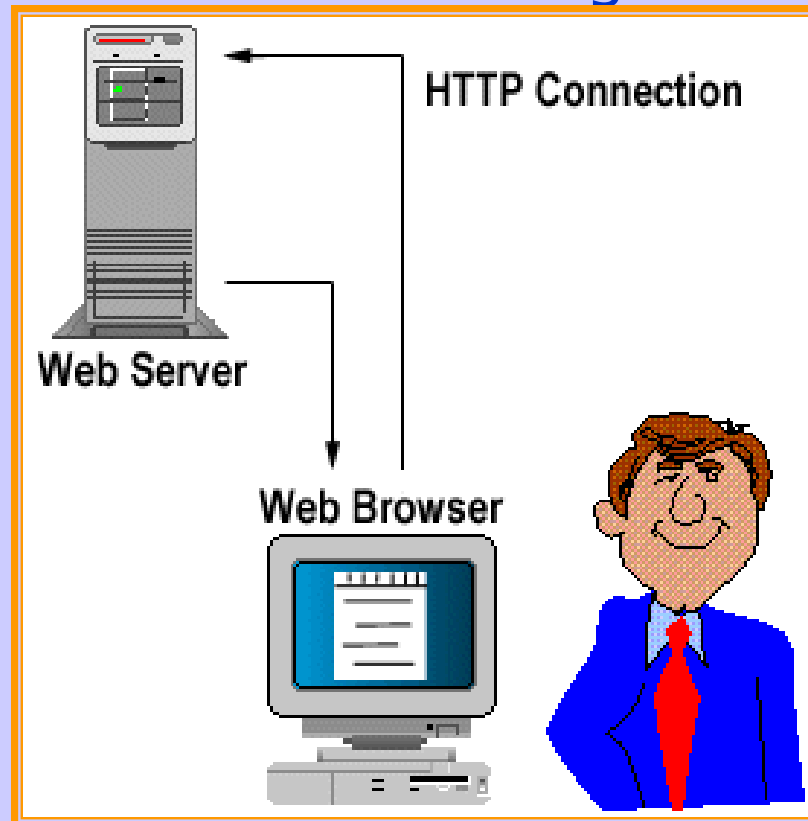
What is a client/server system?

- The "wires" is possibly a twisted pair network hooked into a local telephone company POP or a cable or fiber optics network hooked up to a corporate WAN or LAN that is also linked up to the national telecommunications / information infrastructure through a local telephone company.

What is a client/server system?

- The whole process looks something like the figure below:

What is a client/server system?

- So if the web is a huge client/server system, what is the underlying client/server protocol that is used by the client software and the server software for communication?

- Well the client/server protocol used by the web is HTTP (HyperText Transport Protocol).

- HTTP is a protocol that is defined in several RFC´s (Request for Comments) located at the Internic and has had several generations worth of revisions (HTTP/09, HTTP/1.0 and HTTP/1.1).

HTML the Language of the Web

- So what does a web browser (client software) do with a file it receives from a web server (server software)? Does it just display it to the human user as is?

- The answer is yes and no. Actually, in some cases, the web browser will display a document exactly the way it receives it from the web server. For example, if the document requested is an image, the web browser will display it directly. Similarly, plain text files will be displayed just as they are sent.

- However, if the document is an HTML document, the web browser will "interpret" the HTML and display it according to the instructions contained within the HTML code.

HTML the Language of the Web

- Well, what is HTML code and why must it be interpreted?

- HTML (Hyper Text Markup Language) is a very simple language used to "describe" the logical structure of a document.

HTML the Language of the Web

- Is HTML a Programming Language?
- Actually, though HTML is often called a programming language **it is really not**.
- Programming languages are 'Turing-complete', or 'computable'. That is, programming languages can be used to compute something.
- Typically programming languages use conditional branches and loops and operate on data contained in abstract data structures.
- HTML is much easier than all of that. HTML is simply a '**markup language**' used to define a logical structure rather than compute anything.
- It is a semantic issue, but it is one which you should officially be aware of.

HTML the Language of the Web

- For example, it can describe which text the browser should emphasize, which text should be considered body text versus header text, and so forth.

- The beauty of HTML of course is that it is generic enough that it can be read and interpreted by a web browser running on any machine or operating system.

- This is because it only focuses on describing the logical nature of the document, not on the specific style.

- The web browser is responsible for adding style. For instance emphasized text might be bolded in one browser and italicized in another. It is up to the browser to decide.

THANKS