

# Web Technologies and Applications

Winter 2001

## CMPUT 499: Internet and WWW

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## Impact

- Babyboomer after the WWII, generation X late 60s.
- I have the incline to call the last generation: **generation Internet** due to the impact on their lives.
- A teenager is buying his first CD on-line.
- A grandmother is e-mailing her friends around the world using her television.
- The Internet has a profound impact not only on the new generation, but on all people off all ages where ever they are.

## Course Content

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| <ul style="list-style-type: none"><li>• Introduction</li><li>• <b>Internet and WWW</b></li><li>• Protocols</li><li>• HTML and beyond</li><li>• Animation &amp; WWW</li><li>• Java Script</li><li>• Dynamic Pages</li><li>• Perl</li><li>• Java Applets</li></ul> | <ul style="list-style-type: none"><li>• Databases &amp; WWW</li><li>• SGML / XML</li><li>• Managing servers</li><li>• Search Engines</li><li>• Web Mining</li><li>• CORBA</li><li>• Security Issues</li><li>• Selected Topics</li><li>• Projects</li></ul> |
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## Objectives of Lecture 2

### Internet and WWW

- Get a brief overview of the history of the Internet and the different tools that exist on the Internet;
- Understand the distinction between the Internet and the World-Wide Web.

## Outline of Lecture 2



- The Memex machine: the dream will come true
- Hypertext: linking new kinds of documents
- The Internet: infallible information exchange
- The World-Wide Web and the start of a new era
- Web-based applications
- Some terminology

## When Did It All Start?



- In 1945, Vannevar Bush wrote an article “*As We May Think*” describing a machine, Memex, containing human collective knowledge organized with “*trails*” linking materials of the same topic.
- The article revolutionized information technology before even the existence of modern computers.

## Where is the memex?

- Memex is hypothetical machine.
- The information stored ought to be accessible.
- We haven’t fulfilled the dream yet.
- But much has been achieved in 50 years.

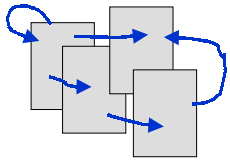
## Outline of Lecture 2



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# Hypertext-Hyperlink-Hypermedia

- Following Memex idea, Ted Nelson developed the Xanadu project which aimed at placing the entire world's literary corpus on-line.
- Ted Nelson coined the term *hypertext* in 1965.



A document is not contiguous but is a set of connected parts of documents. Hyperlinks are links that connect sub-documents. Hypermedia is a multimedia hypertext document,

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# ARPAnet

- In the heart of the cold war, ARPA (Advanced Research Projects Agency) was created (1957). The purpose was to outrun the Russians in the race for mastering rocket launching.
- In 1969, it was decided to link sensitive computer centres by a network in order to withstand a possible nuclear attack. The idea was to allow centres to communicate even after a centre is destroyed. (Bob Taylor's idea)
- It connected government labs, major research centres and universities.
- It existed until 1988 and was officially dismantled in 1990.
- Backbone Network speed: 64Kbits/second
- Major achievements:
  - TCP/IP, Domain Name Service, e-mail (SMTP), FTP, Telnet...

# NSFnet

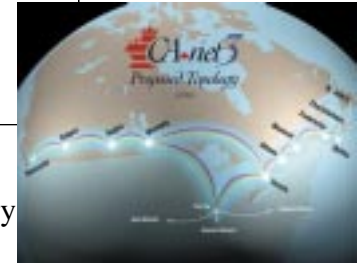
- DARPA, the Defense Advanced Research Projects Agency, still exists and the military have their own network but the original ARPAnet was integrated into the current Internet.
- The National Science Foundation in the USA funded the NSFnet which was created in 1985.
- Backbone Network speed: T1 (1.5mb/sec.) to T3 (45mb/sec.)
- It originally connected 5 major universities with supercomputer centres, but rapidly included other universities, research centres and private companies.
- Replaced ARPAnet as the backbone of Internet in 1990

# What about the Internet?

- The Internet didn't originate in the USA alone.
- Other networks existed in North America and Europe and other places in the world.
- BitNet, for instance, connected many research centres and universities.
- Bridges connected these networks to create a larger international network: the Internet.
- Late 90s: Internet2, funded by US universities, a sequel to NSFnet with new protocols.

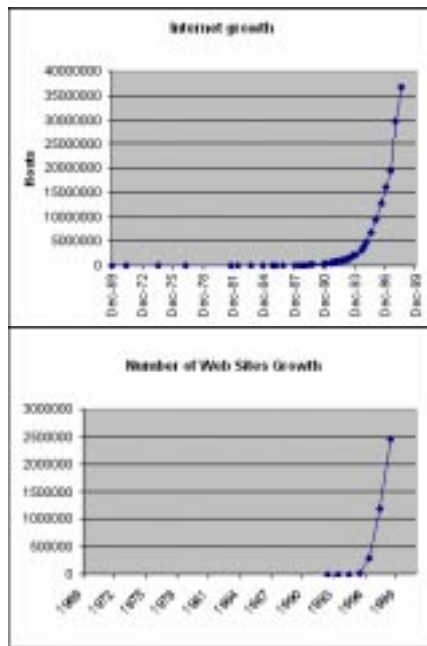
# CA\*net

	Year	Speed	USA equivalent
CA*net	1990	1.5 mb/s	NSFnet
CA*net 2	1997	155 Mb/s	Internet2
CA*net 3	1999	2.5 Gb/s	Internet2 Abilene & vBSN projects

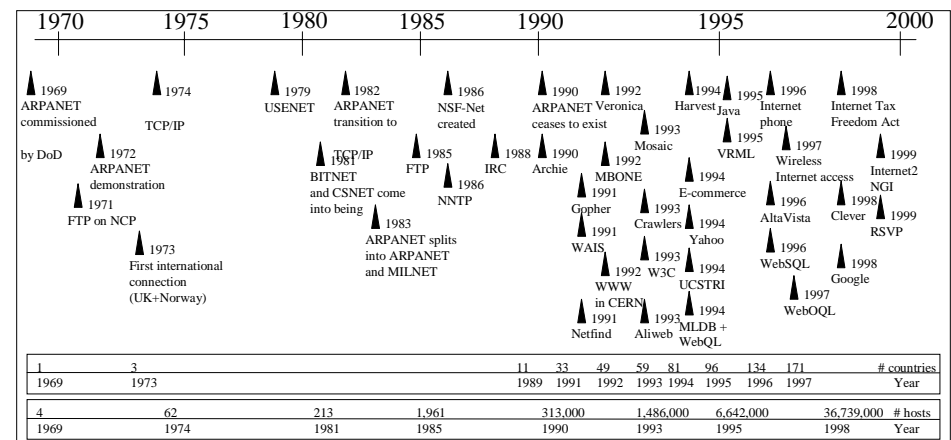


Alberta also has a project for a high speed connection between Edmonton and Calgary

# Explosive Growth



# Internet Timeline



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## Advent of the World-Wide Web

- In 1990, Tim Berners-Lee developed a on-line hypertext-based system to help researchers at CERN in Switzerland share information across a diverse computer network.
- He came up with first versions of HTML (based on SGML) and the HTTP protocol.
- HTTP and HTML catapulted the Internet to new heights.
- The WWW revolutionized the use of the Internet thanks to a multimedia user friendly interface: a web browser.
- Mosaic was developed in NCSA by students at the University of Illinois in 1993, among them Marc Andreessen who created Netscape in 1995.

## The WWW is not alone

- There are other tools on the Internet. They could be classified as:
  - **Command Line.** Ex: FTP (1971)
  - **Menu-based.** Ex: gopher (1991)
  - **Search engine.** Ex: WAIS (1991)
  - **Hypermedia.** Ex: WWW (1991)

## Other Taxonomy of Internet Tools

- Communication services
  - E-mail, newsgroups (usenet), telnet, internet relay chat (IRC), ...
- Information storage and exchange
  - FTP, Gopher, Alex, ...
- Information Indexing
  - Archie, Veronica, Wais, UCSTRI, Whois, ...
- Interactive Multimedia information delivery
  - WWW and its indexes.

# Outline of Lecture 2

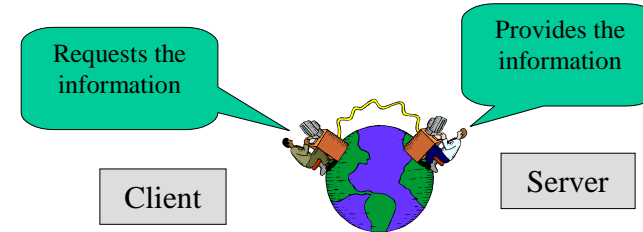


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- **Web-based applications**
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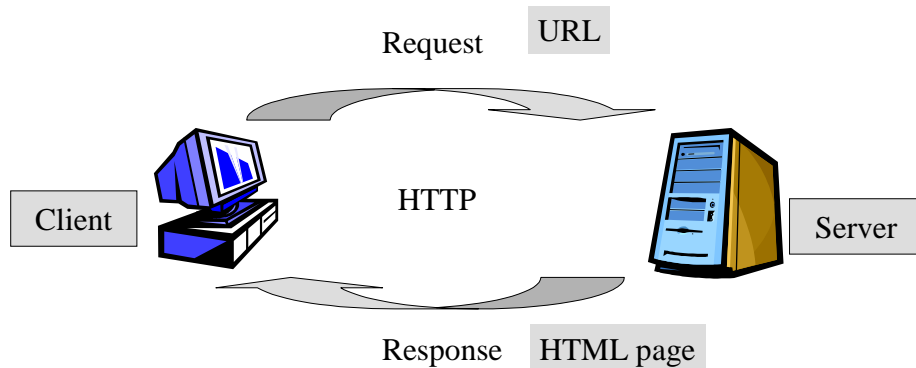
# Client-Server Architecture



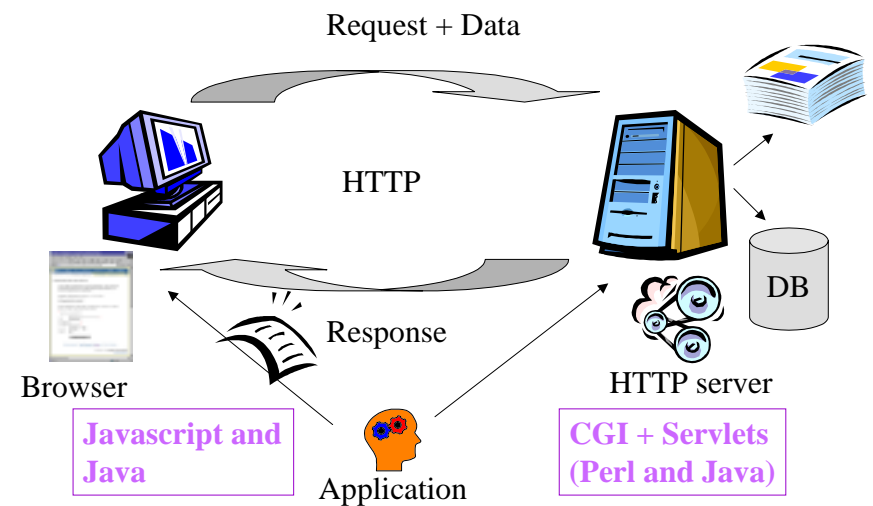
The World-Wide Web is an assortment of interconnected computers. In this context, computers provide data to other computers.



# Client-Server Architecture



# Client-Server Architecture



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## Terms in the Glossary

- **Internet:** group of networks connected together. The Internet refers to the global connection of networks around the world.
- **LAN:** Local Area Network: a group of computers, usually all in the same room or building, connected for the purpose of sharing files, exchanging email, and collaboration.
- **Intranet:** internal company network. Internal use of web capabilities.
- **Extranet:** ability to securely connecting the intranet with defined external networks.
- **CGI:** Common Gateway Interface: means of developing application for the web on the server side.
- **Middleware:** a tier usually between a web application or a web server and a database or another application layer.