

# Internet and Intranet Computing

By

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# Universities & Research Labs

*humanity's greatest institutions*

Special places set aside to dream and to build.

A university is a place designed to give 18-22 year olds “ a dream to last a lifetime”.

A Research Lab is a place “to go where no one has gone before”.

# Places of Fairy Tales & magic

- Universities are also places for dreamers who work very hard on hard problems
- The recurring questions in such places are “Is it the right thing?” and “Is it fun?”
- MSC, Ohio, Arabia, Stanford, IBM-Cambridge, MIT

# Once Upon a time ... or

- *A long time ago, in a galaxy far, far, away...*
- If you are like me you, are already hooked and ready to settle in to hear a fairy tale, to enter an enchanted world . Let's not ...
- Instead, let us re-enter our own real world and notice it is enchanted. Two accidents that could not happen, did! The Internet and the Web.

# Internet Definition

The Internet is a public, cooperative, and self-sustaining facility accessible to hundreds of millions of people worldwide.

Physically, the Internet uses a portion of the total resources of the currently existing public telecommunication networks.

What distinguishes the Internet is its use of a set of protocols called TCP/IP (Transmission Control Protocol/Internet Protocol). Two recent adaptations of Internet technology, the intranet and the extranet, also make use of the TCP/IP protocol.

# What is the Internet?

The Internet is a *communications facility* designed to connect computers together so that they can exchange digital information. For this purpose, the Internet provides a basic communication service that conveys units of information, called *packets*, from a source computer attached to the Internet to one or more destination computers attached to the Internet.

The Internet also provides supporting services such as the naming of the attached computers. Several high-level services or applications use this basic communication service, including the World Wide Web, Internet e-mail, Internet "newsgroups", distribution of audio and video information, and file transfer and "login" between distant computers. - *details, details*

# What is else is the Internet?

The Internet is a global implementation of technology

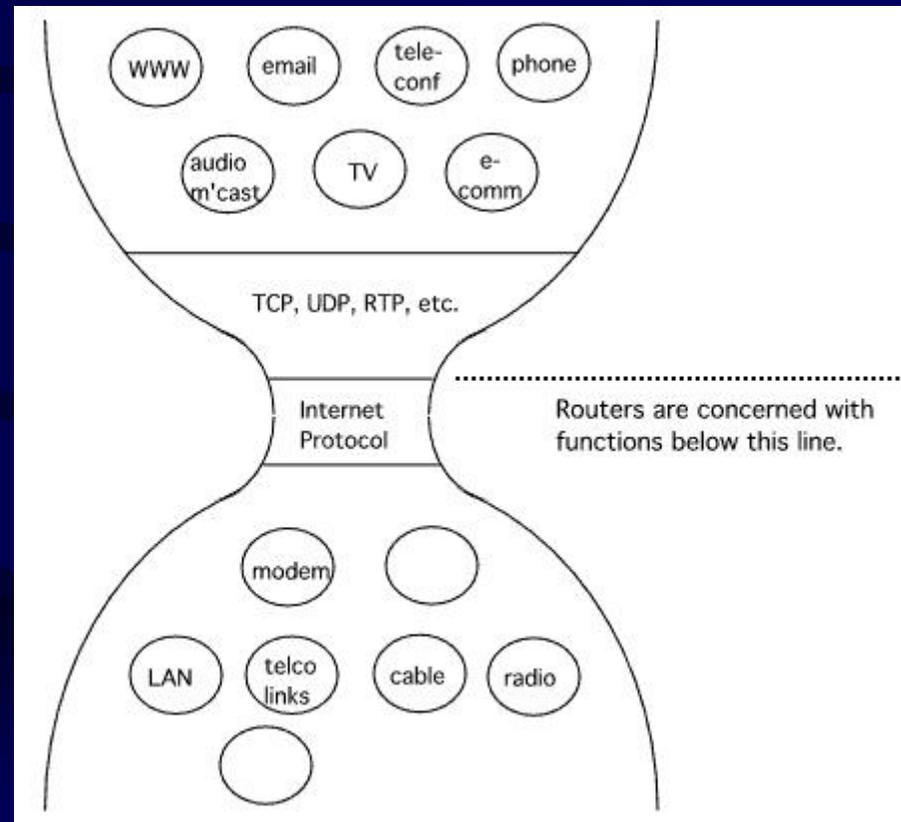
Because it delivers information globally and (across language barriers) it is a change accelerator.

good /bad ?? it just is.

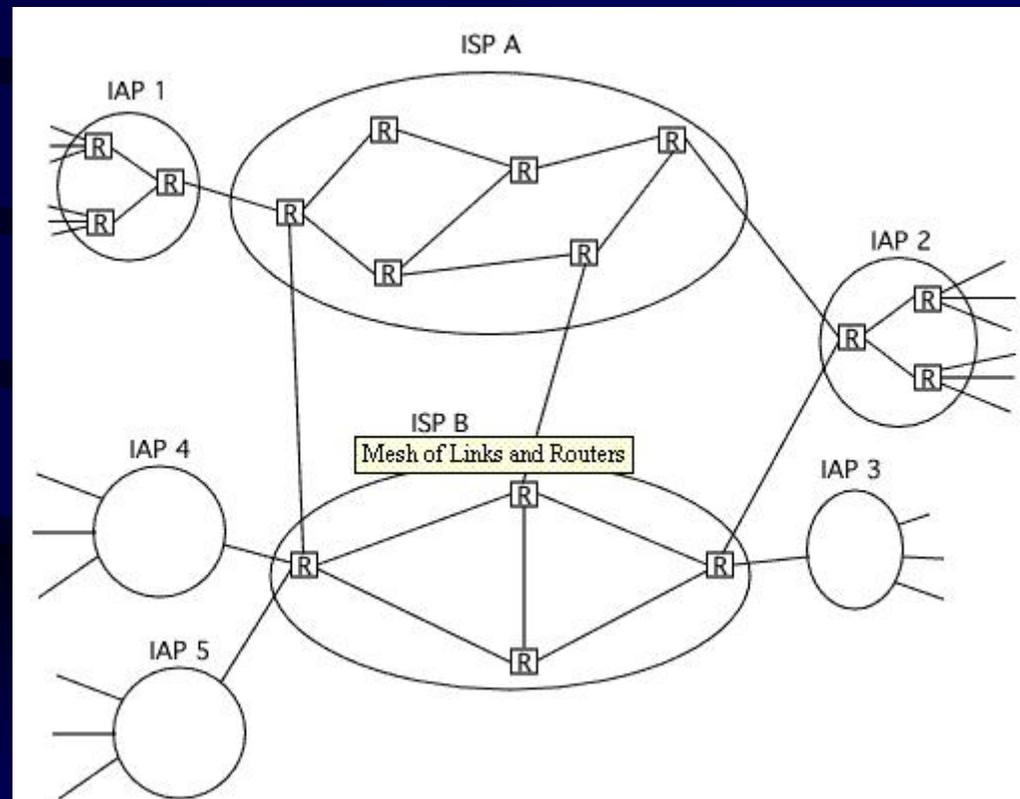
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For many of us it is “WEBNET” -  
The World Wide Web running on the Internet.

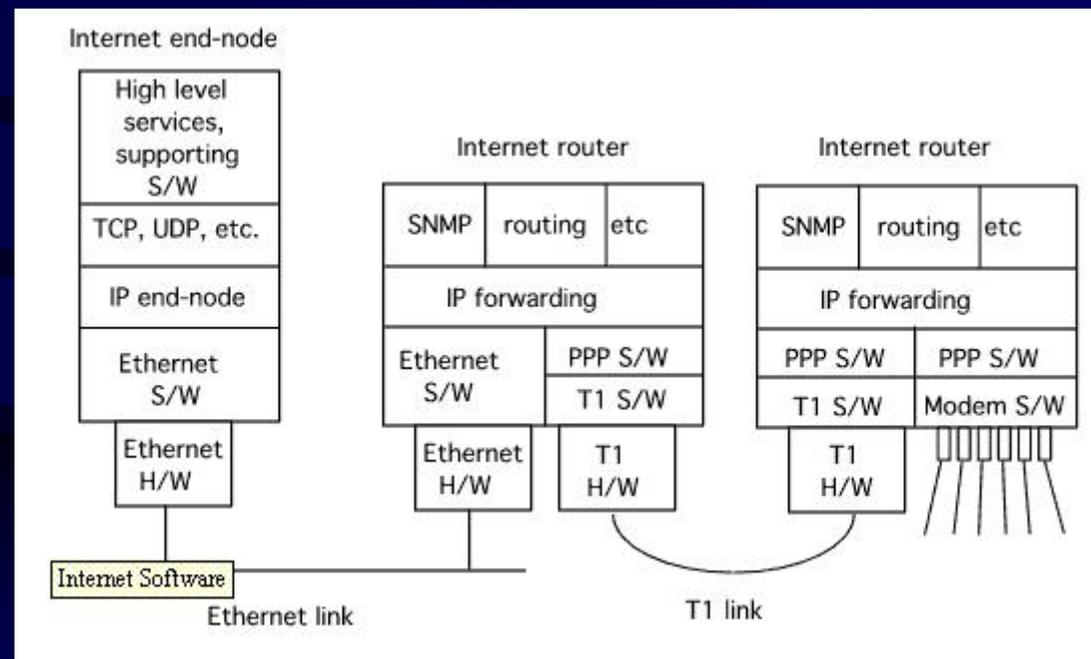
# IP -routers



# ISP s - IAP s



# End Nodes and Routers



# The Internet Story

- see <http://www.lcs.mit.edu/impact/>

By Dave Clark

# Gedanken experiment ---

Let us convene the human institutions for a common purpose of some mutual benefit to the globe -- any set of institutions any global benefit

Let us have a process and when it is finished something, anything will be globalized !

Can't do it. Been tried! Fails every day ..

# Accident 1 - The Internet

A government project for defense department use connects some research universities, Arpanet - ARPA contractors only ...

A spooling program on one company's computer connects a university by telephone to another university - Bitnet!

Connect Bitnets in the US to Bitnets in Europe & elsewhere connect Arpanet to BitNets for etc. Connect all nets , normalize on TCP/IP--

## The Internet.

Oops! the world is connected by internet links, email flows freely, even when some governments would like to stop it, or other institutions with a desire to control information flow would like to limit it.

# A story...

- In 1983, I returned to Saudi Arabia and worked with some people to build a BITNET system connecting Universities in Saudi Arabia, Bahrain and Kuwait. It became GULFNET.
- IBM was willing to pay for a telephone line to connect GULFNET to EARN (European Academic Reserach NET which had already been connected to the US. At the last moment, permission to coinnect was withheld.
- Someone with an agenda different from mine had decided that an open email link to the world was not that useful.

# Accident 2 - The Web

- The first step of machines all connected having occurred ... giving all people easy access to information on machines globally was a second accident.
- Tim Berners-Lee used email to work with others and created the WWW and then gave it away! The globe of people is casually exchanging information
- rerun the gedanken experiment -- Accident 2

# Gatekeeping is a serious job

- Human institutions (government, education, religious and industrial) have agendas they enforce around the globe or in the village.
- Commercial institutions use the strategy - run a gate across a roadway and collect tolls. Other institutions find bridges and limit items that are not on their agendas.
- Global connectivity is clearly a problem for non-global institutions. If they had been asked, delay would have occurred until the integrity of the agenda could be maintained.
- But no one asked -- Now the question -- who “controls” the internet -- No one! OOPS.

# Happy Accidents

- I think we can all agree -- Global information connectivity is a good thing. The accident happened and it is a good thing! (We just could not cause it to happen again.)
- The WEBNET - an accident. ---A fairy tale that is real.

# Furthering our plans

- Let's agree to keep the WEBNET working and to increasing access as a ( to sell ideas or products, I want everyone to have access.)
- Let all of us be aware of how fragile the WEBNET accident was. As we work hard to further our own agendas, think global, do not take actions for our agendas, that could limit internet connectivity.
  - A META rule is -  
“Keep connected and increase access”

# Why?

- TO BUILD --This will benefit your agendas by allowing you to exchange ideas with other people everywhere who share your agenda, ( of course those who oppose you can also exchange ideas).
- TO SELL -You can promote and distribute the contents of your agenda to all.

# Going to the Moon

- Glenn Larrymore -- “ I was a pro - I knew it was impossible.”
- How?
- Nobody told the kids!

# A Phase Change - pace of change?

- Information flow on foot, by horse, by plane  
mechanical speed ( 700 mi/hr)
- Information flow by Internet ( 186,000  
mi/sec)
- Solid -> Liquid -> Gas ?

# Collective Consciousness

(its only information )

- This Globalization of information is real - the collective consciousness of the information of the planet (now across language barriers) is a magic, fairy tale moment in history
- For example, in rural NH, a “let’s ask the world the question” experience-

# New Rules Human affairs?

- A Global Economy of Commerce
- Maybe a change to the “second” human impulse - to give
- We do not apologize for the first impulse- to take
- Open sources?

# Open Global Information

- Global Problems need all our talents to solve them
- As education is revolutionized and information flows freely, the odds of finding a solution go up.
- Research problems can be solved if everyone communicates. 1 in 5B? (Cancer, global warming, balance of wealth)

# Enterprise

In the computer industry, an enterprise is an organization that uses computers. This word encompasses corporations, small businesses, non-profit institutions, government bodies, and possibly other kinds of organizations. The term is applied much more often to larger organizations than smaller ones.

# INTRANET

A network of networks that is contained within an enterprise. It may consist of many interlinked local area networks and also use leased lines in the wide area network. Typically, an intranet includes connections through one or more gateway computers to the outside Internet. The main purpose of an intranet is to share company information and computing resources among employees. An intranet can also be used to facilitate working in groups and for teleconferences.

An intranet uses TCP/IP, HTTP, and other Internet protocols and looks like a private version of the Internet. With tunneling, companies can send private messages through the public network, using the public network with special encryption/decryption and other security safeguards to connect one part of their intranet to another.

Typically, larger enterprises allow users within their intranet to access the public Internet through firewall servers that have the ability to screen messages in both directions so that company security is maintained. When part of an intranet is made accessible to customers, partners, suppliers, or others outside the company, that part is called an extranet.

# E-commerce

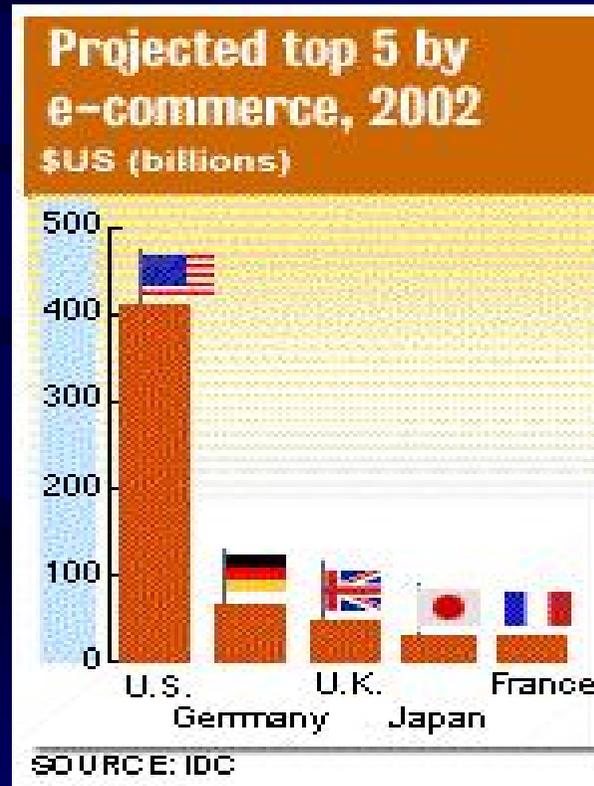
- As we work with the Internet Web to make Global Ecommerce work, we must keep this delicate system (accidental) system open and global
- Global so that ideas can be exchanged to solve big problems without barriers
- Open so that everyone with an answer, can access problems and the tools to solve them.

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Sometime this year, for the first time, Americans will no longer make up the majority of the Internet population, according to International Data Corp.

# Global Ecommerce

The impact of this shift on e-commerce will be striking: The U.S., which accounted for 76 percent of online commerce revenue in 1998, will account for only 55 percent of revenues in 2002.



# A note of caution

As Professionals Working on the Hard problems to  
create Global E commerce, and establishing  
intranets, when we think of (or hear of)  
**impossible** goals,  
that are dreams and fairy tales...  
that we know can **never** be reached...  
let us remember, anything is possible, just

**DON'T TELL THE KIDS!**

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Thank You