

Introduction

COMP467
Networked Computer Systems

Networks are Everywhere

- People don't buy computers to compute. They buy computers to **network**.
- Email and web surfing is what people do with computers.
- Network your toaster.
- Consider monitoring grandma's refrigerator light to make sure that she is active.



Everything is Networked

- All computers on campus are networked.
- Almost every computer sold is network capable.
- Most cell phones will run Java.
- Small wireless sensor networks connect many small sensors.
- The Amazon Kindle lets you read books.



Internet history

- Started as Arpanet with about 10 universities in the 1970's
- Internet used by academia for email until web developed in early 1990's
- Now over 250 million computers are on the Internet

Size of the Internet

number of computers connected to the Internet

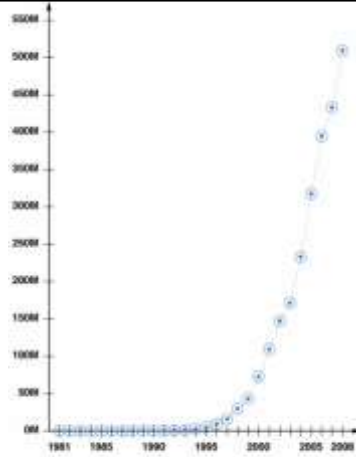


Figure 2.1 Internet growth plotted as the number of computers on the Internet.
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Size of the Internet log scale

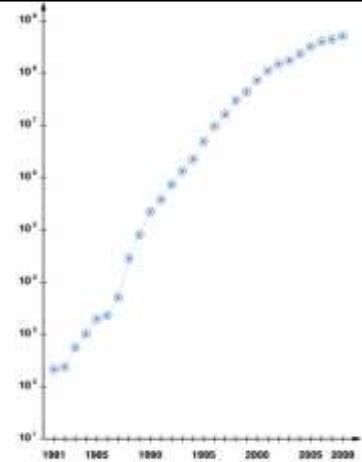
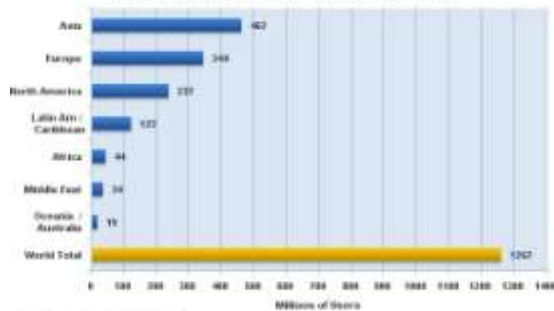


Figure 2.2 Internet growth plotted on a log scale.
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Many People use the Internet

World Internet Users - November 2007

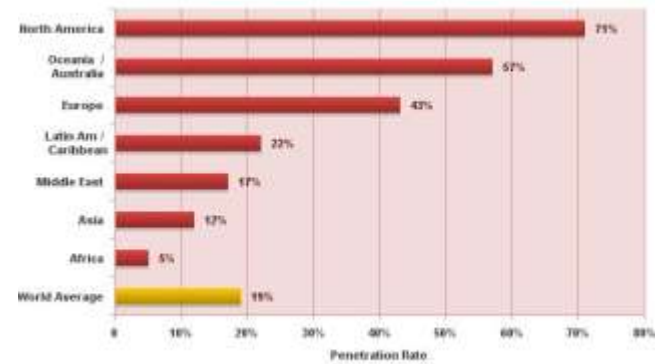


Source: www.internetworldstats.com
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As of 2008, 1.6 billion people use the Internet according to World Bank, World Development Indicators

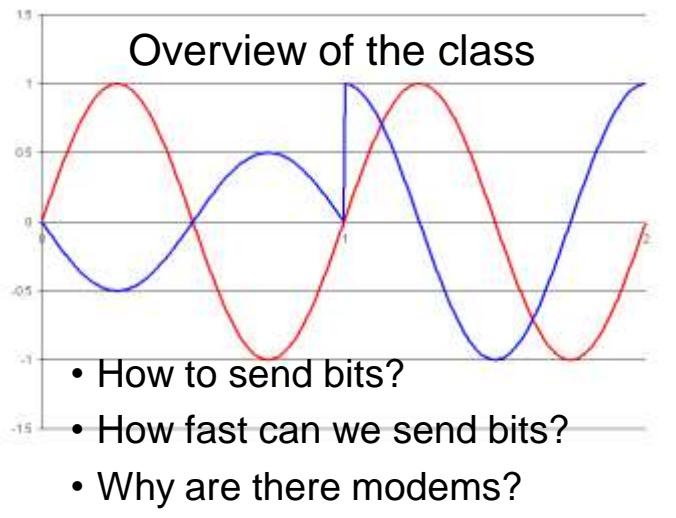
Internet Users as Percent of Population

World Internet Penetration - November 2007

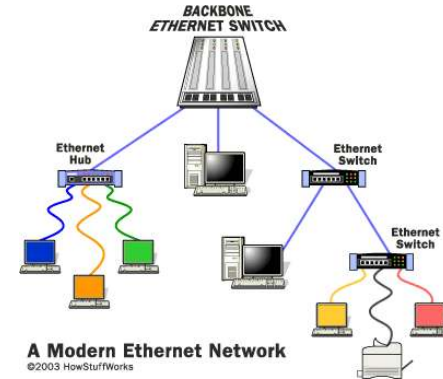


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Overview of the class



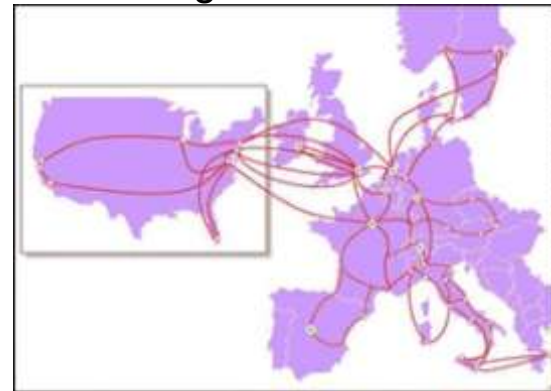
How can we connect a LAN?
How do you connect networks together?



How does the phone network work?

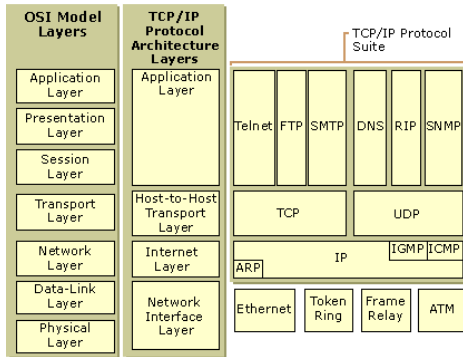


How does data find its way through the Internet?

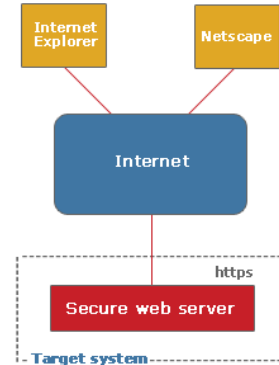


What is TCP?

What are the other options?



What does HTTP do?



How can you keep your network secure?



History of Networking

- 1793 Claude Chappe develops the optical telegraph
- 1844 Samuel Morse develops the electrical telegraph
- 1876 Alexander Graham Bell invents the telephone

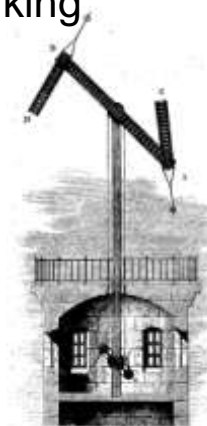


Fig. 11. — Télégraphe de Chappe.

History of the Internet

- 1969 ARPANET created at UCLA connected at 50kbps
- 1970 AlohaNet is operational
- 1971 15 nodes on ARPANET
- 1973 Bob Metcalfe's PhD Thesis outlines Ethernet.
- 1974 Vint Cerf and Bob Kahn publish TCP design

MAP 4 September 1977

History of the Internet

- 1978 TCP split into TCP and IP
- 1981 BITNET and CSNet are created
- 1981 TCP/IP becomes standard protocol for Internet
- 1983 Name server developed at U of Wisconsin
- 1986 Internet Engineering Task Force created
- 1991 WWW released by CERN; Tim Berners-Lee
- 1993 World Wide Web Consortium (W3C) created
- 1995 Sun launches Java

Public and Private Parts of the Internet

- The Internet consists of parts that are owned and operated by individuals or organizations
- A **public** network is run as a service that is available to **subscribers**
 - Any individual or corporation who pays the subscription fee can use
 - A company that offers service is known as a **service provider**
- A **private** network is controlled by one particular group
 - network use is restricted to one group
 - a private network can include circuits **leased** from a provider

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Reading

- Read Chapters 1-3 of the textbook for Tuesday.