The State of the WWW

Michael B. Spring
Department of Information Science and
Telecommunications
University of Pittsburgh
spring@imap.pitt.edu
http://www.sis.pitt.edu/~spring

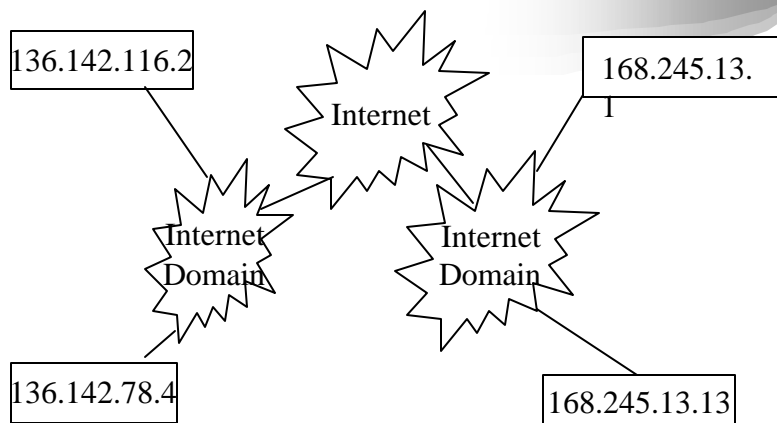
Overview

- Conceptually
  - The Internet
  - The World Wide Web
  - Client-server computing
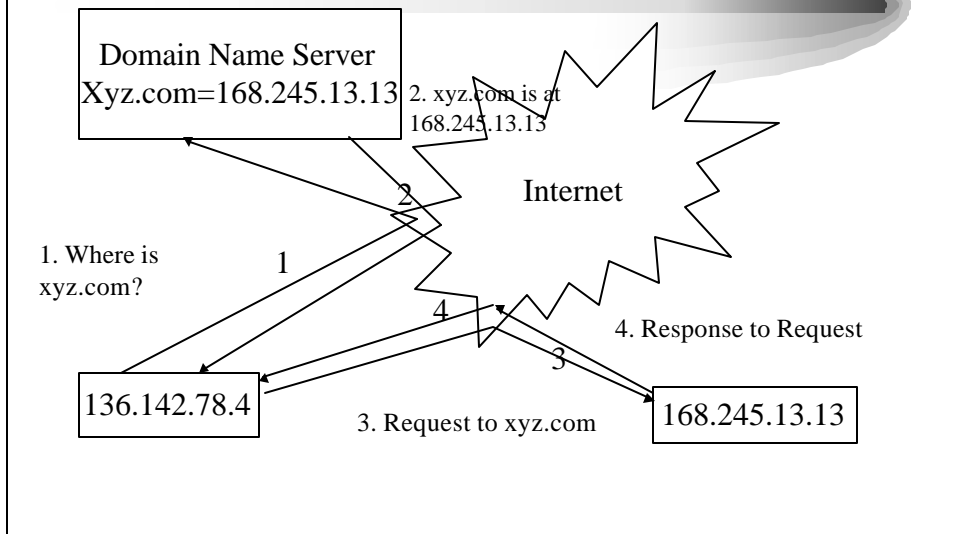 - Protocols
- Data
  - Users
  - Spending
  - Advertising

The Internet

- The internet is a set of communicating machines
- The basis for communications is:
  - a shared machine address space (IP)
  - A name lookup mechanism -- Domain Name Space (DNS)
  - A protocol for reliable messaging (TCP)
  - A protocol for doing business (http)
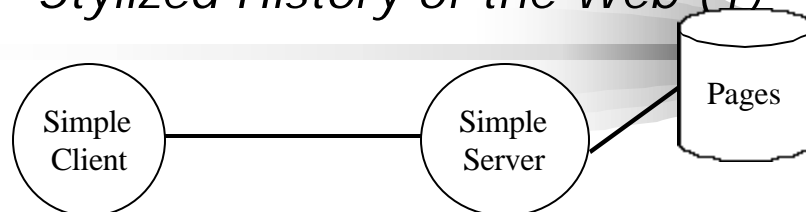 - Software to interpret the messages exchanged

The Internet Generically

136.142.116.2

Internet

168.245.13. 1

Internet Domain

Internet Domain

136.142.78.4

168.245.13.13

An Internet Transaction

Domain Name Server
Xyz.com=168.245.13.13

2. xyz.com is at
168.245.13.13

Internet

2

1. Where is
xyz.com?

1

4

4. Response to Request

3

136.142.78.4

3. Request to xyz.com

168.245.13.13

Stylized History of the Web (1)

Simple
Client

Simple
Server

Pages

Stylized History of the Web (2)

Simple Client

Simple Server

Pages

Programs & Active Pages

Scripting Language

Stylized History of the Web (3)

Simple Client

Simple Server

Pages

Programs & Active Pages

Scripting Language

Applets & Plug-ins
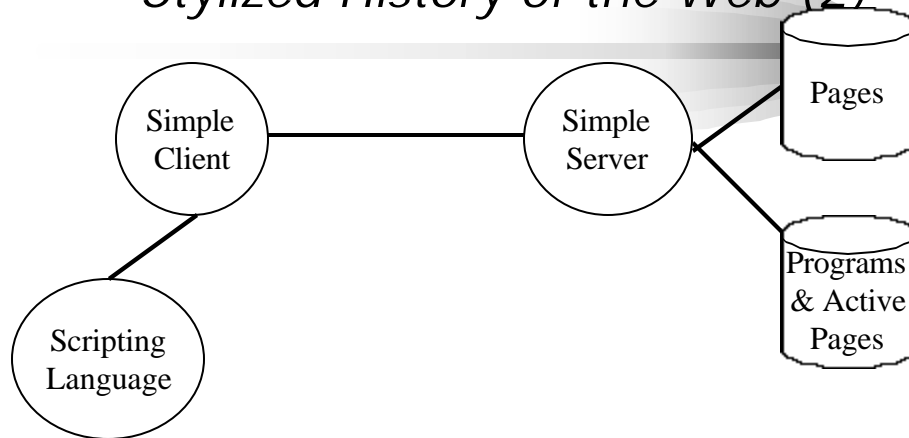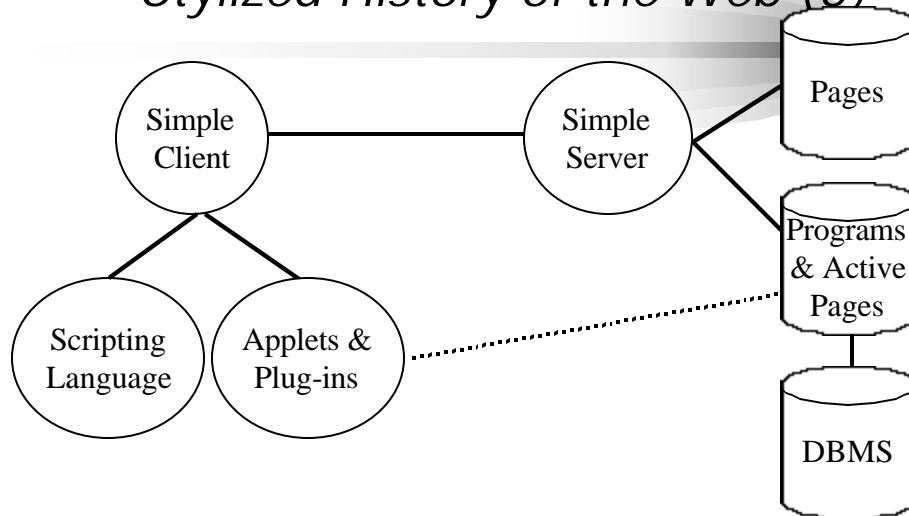
DBMS

Web Evolution

- Generation 1
  - Static pages with editing
  - Static pages with GUI
- Generation 2
  - Dynamic pages on the server (CGI scripts)
  - Dynamic pages on the client (VB/Java scripts)
- Generation 3
  - DBMS back ends on the server
  - Downloadable client extensions (applets)
  - Server Extensions (API's and servlets)
  - ASP and JSP n-tier applications

Client-Server Computing Models

- Servers and daemons
  - Server coding and security
- Protocols
  - IP
  - UDP/TCP
  - Application protocol
    - One shot
    - Dialog – fixed, delimited, TLV
  - Data Interchange
    - Text streams
    - Binary transfer formats

The WWW model

- The web operates on a client server model
- The client is responsible for:
  - Address resolution
  - Page Display
- The server is responsible for
  - Request management
  - Request resolution
  - Processing of dynamic requests

Protocols and Data Interchange

- The http protocol is a simple protocol
  - Make a connection
  - Make a request
  - Accept a response
- The data interchange format for the web is also simple
  - Reminiscent of SMTP
    - Header
    - Blank line
    - Body
- The protocol header and body is not to be confused with the HTML header and body

Statistics on E-Commerce

- Data varies widely based on source
  - Both annual reports and projections
  - Forrester and Jupiter tend to ring true
- The numbers can be confusing:
  - On line spending is the smallest
  - E-commerce is much larger
  - Internet generated revenues is the largest
  - All of these are dwarfed by B2B exchanges
- Sector comparisons can be of interest

Number Online

How Many Online Worldwide

This actually projects a slowdown in new users

26 (1995)
55 (1996)
98 (1997)
150 (1998)
205 (1999)
250 (2000)
350 (2005)

YEAR

NUMBER

Most Visited Sites

Rank	Site	Visitors(,000)
	All Digital Media	88,645
1	AOL Time Warner Network*	69,453
2	Microsoft Sites*	61,371
3	Yahoo!*	58,820
4	Lycos*	33,100
5	About The Human Internet*	27,679
6	Excite Network*	27,635
7	Walt Disney Internet Group*	23,416
8	NBC Internet Sites*	22,077
9	Infospace Impressions*	20,817
10	eBay*	19,840
11	Amazon*	19,249
12	CNET Networks*	18,570
13	AltaVista Network*	18,258
14	Napster Digital*	15,717
15	Viacom Online*	14,834
16	eUniverse Network*	14,379
17	Ask Jeeves*	14,054
18	Real.com Network*	13,656
19	Weather Channel The*	12,129
20	LookSmart*	11,451

Location of Online Users

Geographic Location (1998)

North America 57%

Europe 21.75%

Asia 17%

South America 3%

Africa 0.75%

Middle East 0.5%
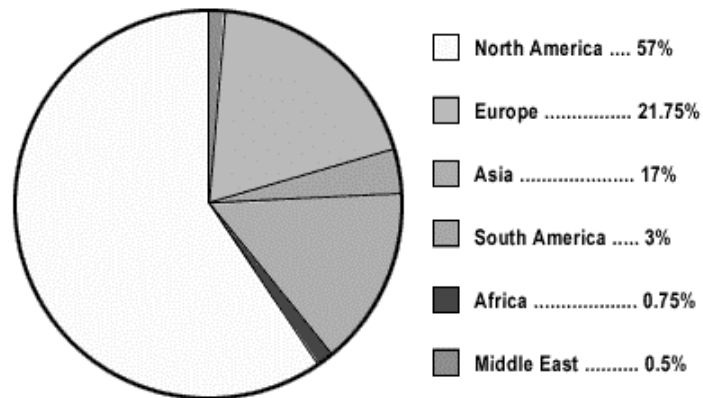
2000 Data on Users

Asia and Europe are increasingly active

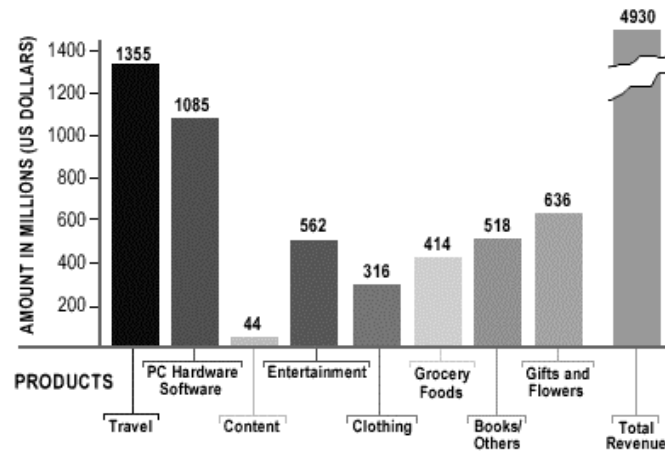| WORLD TOTAL	304.36	100.00%
Africa	2.58	0.85%
Asia/Pacific	68.9	22.64%
Europe	83.35	27.39%
Middle East	1.9	0.62%
USA & Canada	136.86	44.97%
South America	10.74	3.53%

Primary Use of the Web
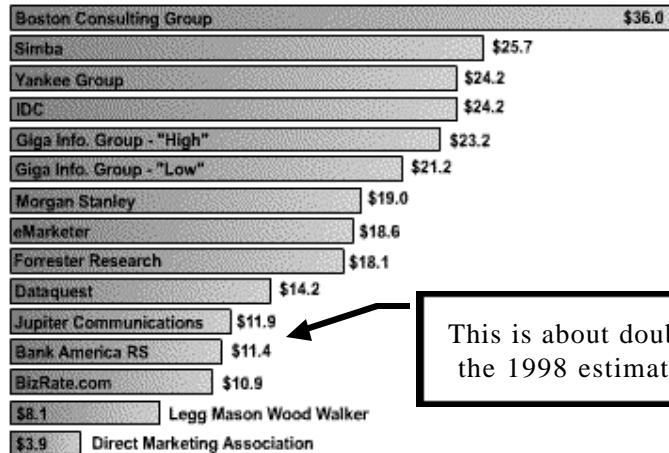
Primary Uses of the Web (1998)
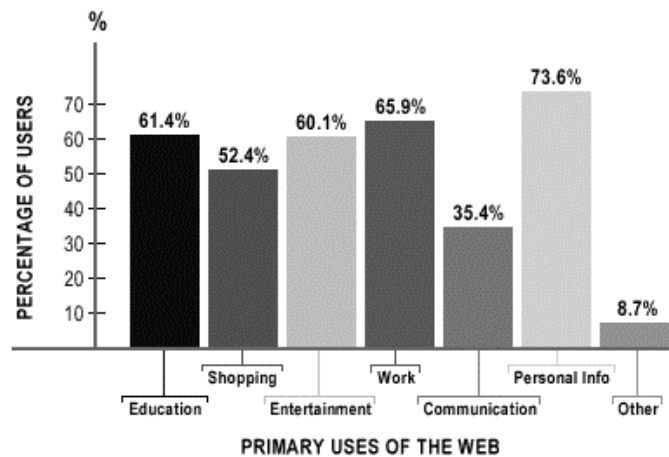
1998 Online Spending

US Consumer Spending Online (1998)

1999 Estimates of Online Shopping

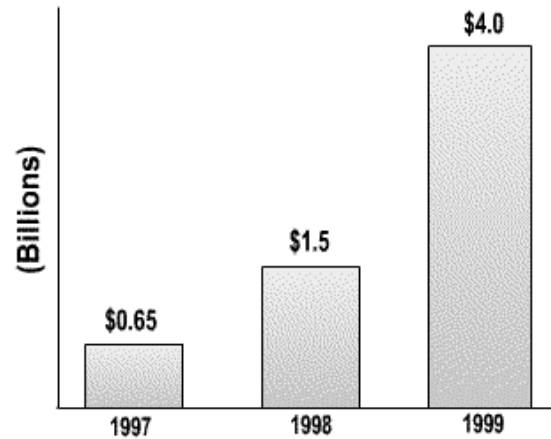### Source Comparison: Estimated Consumer Online Shopping Revenues for 1999 (US Billions)

This is about double the 1998 estimates
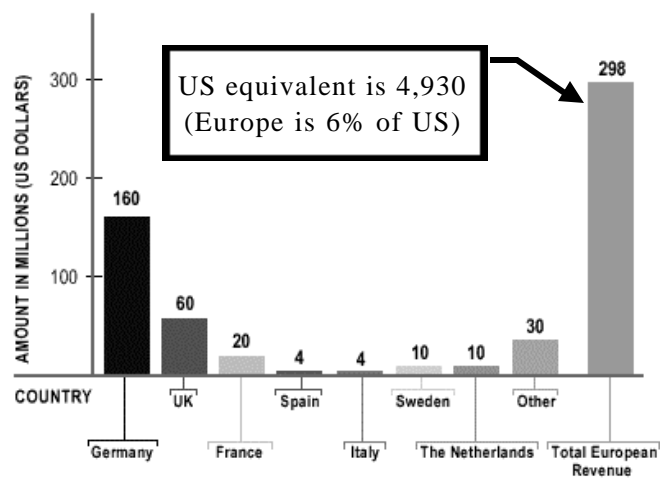
Holiday Shopping(US)
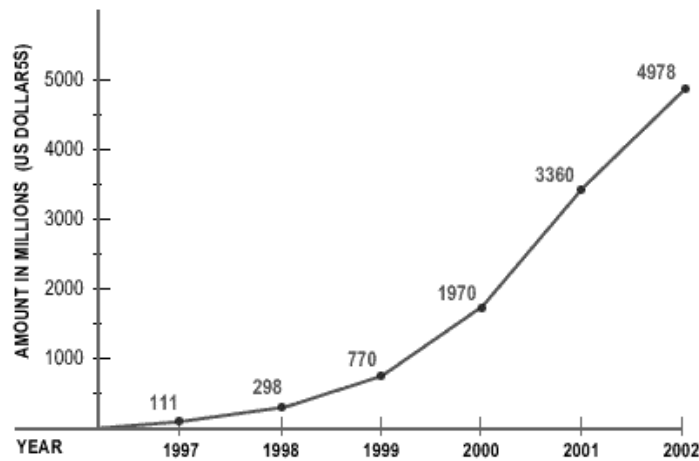
Online Holiday Spending
Thanksgiving - New Year's

European Consumer Spending

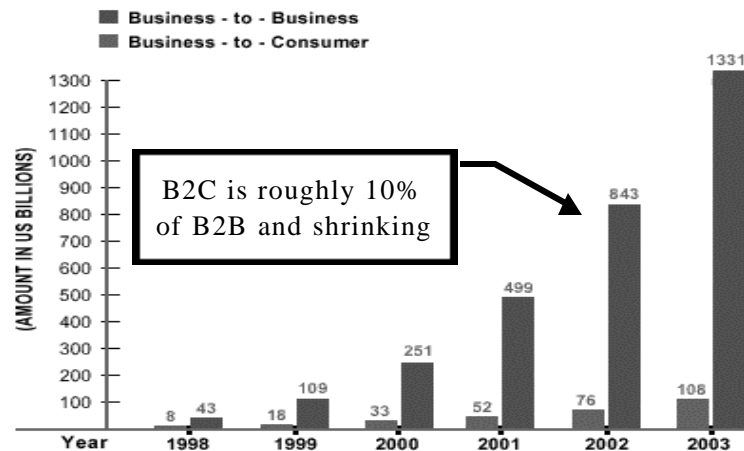Consumer Spending Online at European sites by Country (1998)

US equivalent is 4,930
(Europe is 6% of US)

Trend in European Spending

Consumer Spending at European Sites 1997 - 2002

Y-axis: AMOUNT IN MILLIONS (US DOLLAR5S)

- 1997: 111
- 1998: 298
- 1999: 770
- 2000: 1970
- 2001: 3360
- 2002: 4978

X-axis: YEAR

Projected Growth: US E-commerce

US ECOMMERCE 1998 - 2003

- Business - to - Business
- Business - to - Consumer

Y-axis: (AMOUNT IN US BILLIONS)

B2C is roughly 10% of B2B and shrinking

Year	B2B	B2C
1998	8	43
1999	18	109
2000	33	251
2001	52	499
2002	76	843
2003	108	1331

Internet Generated Revenue

Internet generated revenue 1996 - 2002

AMOUNT IN BILLIONS (US DOLLAR5S)

YEAR	1994	1995	1996	1997	1998	1999	2000	2001	2002
	0.008	0.436	2.9	21.8	73.9	180	377	717	1234
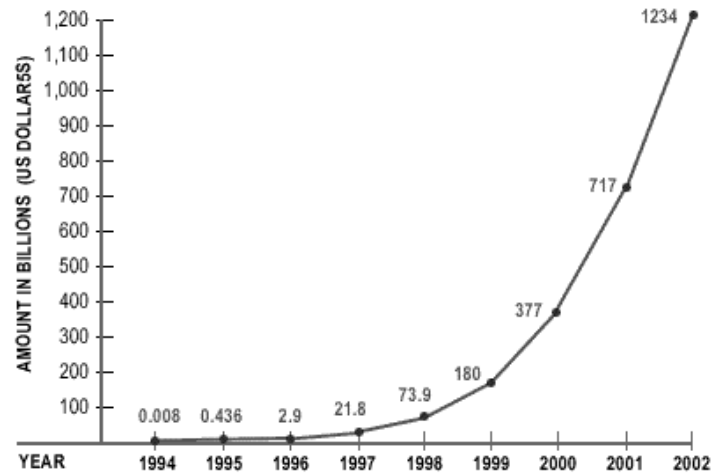
1999 Estimates of Ad Revenues

Source Comparison: US Internet Advertising Revenues in 1999

Source	Revenue
Burst! Media	$839
IAS/CMR[1]	$1,353
IDC	$2,000
Giga Info. Group	$2,340
Yankee Group	$2,400
Myers Group	$2,400
Forrester Research	$2,800
eMarketer	$3,062
Jupiter Communications	$3,200
IAB[2]	$3,431
Internet Stock Report	$3,600
Ziff-Davis	$4,400
ActivMedia	$4,700
Simba	$5,500
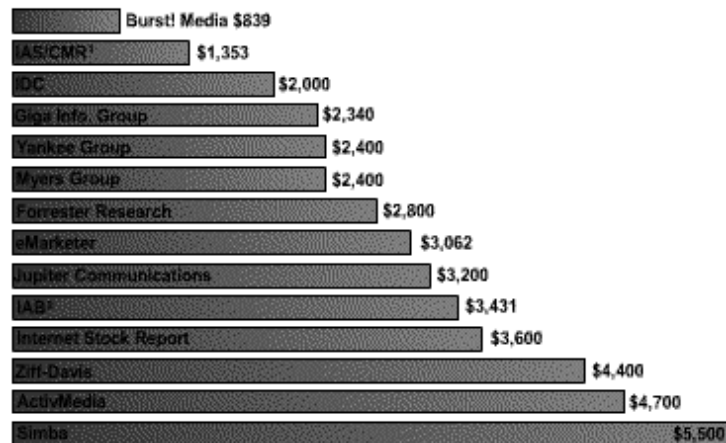
Projected Advertising Revenues
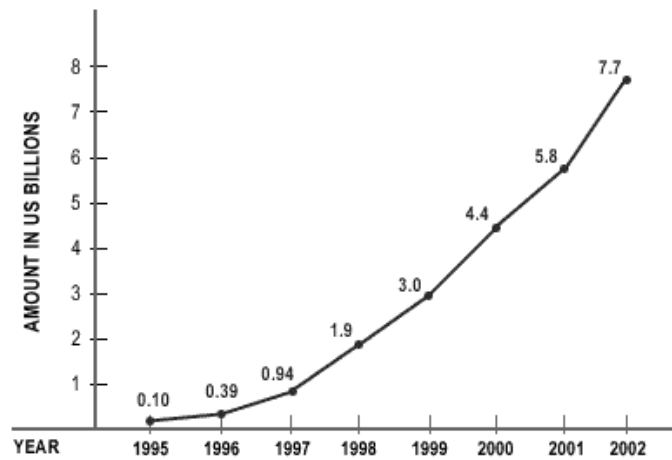
Projected Ad Revenue by Region