Technology Forum

Redefining Collaboration through Groupware

From Groupware to Societyware

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University of Illinois at Urbana-Champaign

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Atlanta, GA

CSC vanguard

Global Digital Library Systems
History of Information Spaces

- 40s visionary systems: Vannevar Bush
- 60s research systems: ARPA/PARC/Nelson
- 70s commercial systems: bibliographic
- 80s library systems: catalogs and full text
- 90s information services: interactive browsing
- Future systems: towards cyberspace

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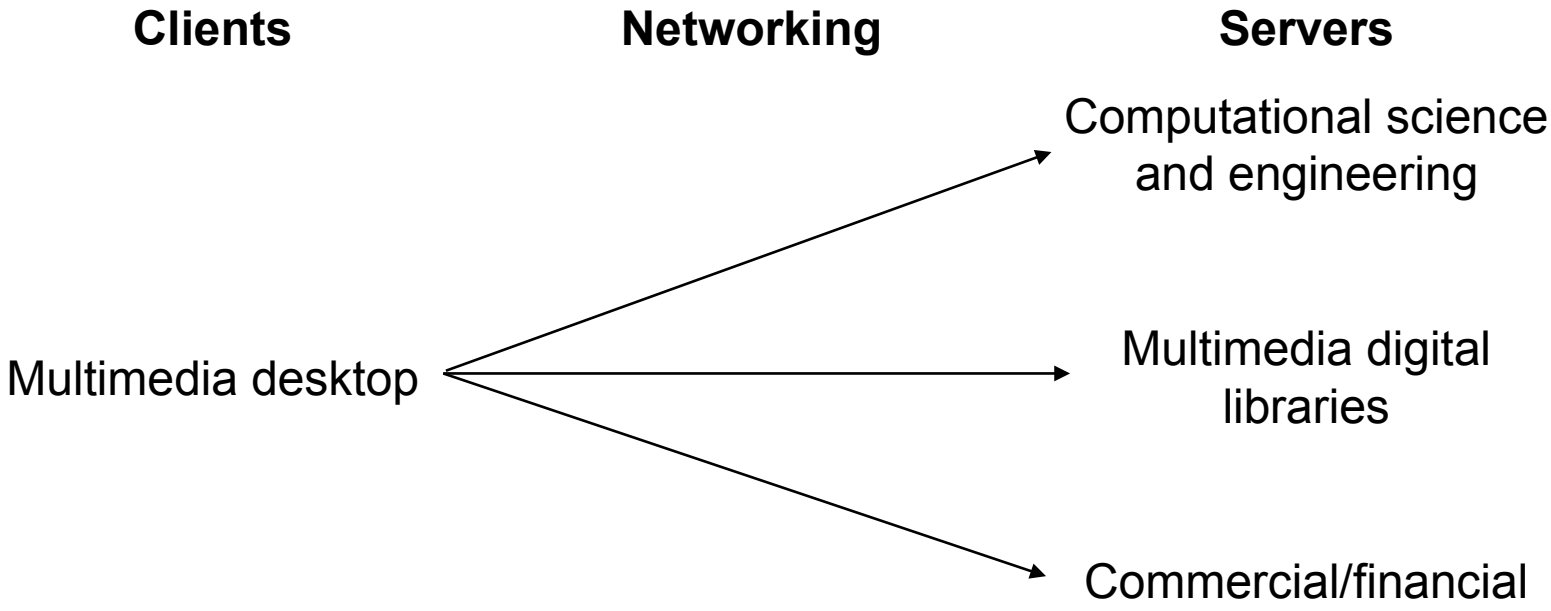
Stages in the Evolution of Information Space

1980s	Internet	Files in the net
1990s	Interspace	Objects in the net
2000s	Cyberspace	Concepts in the net

Source: Bruce Schatz, NCSA, UIUC

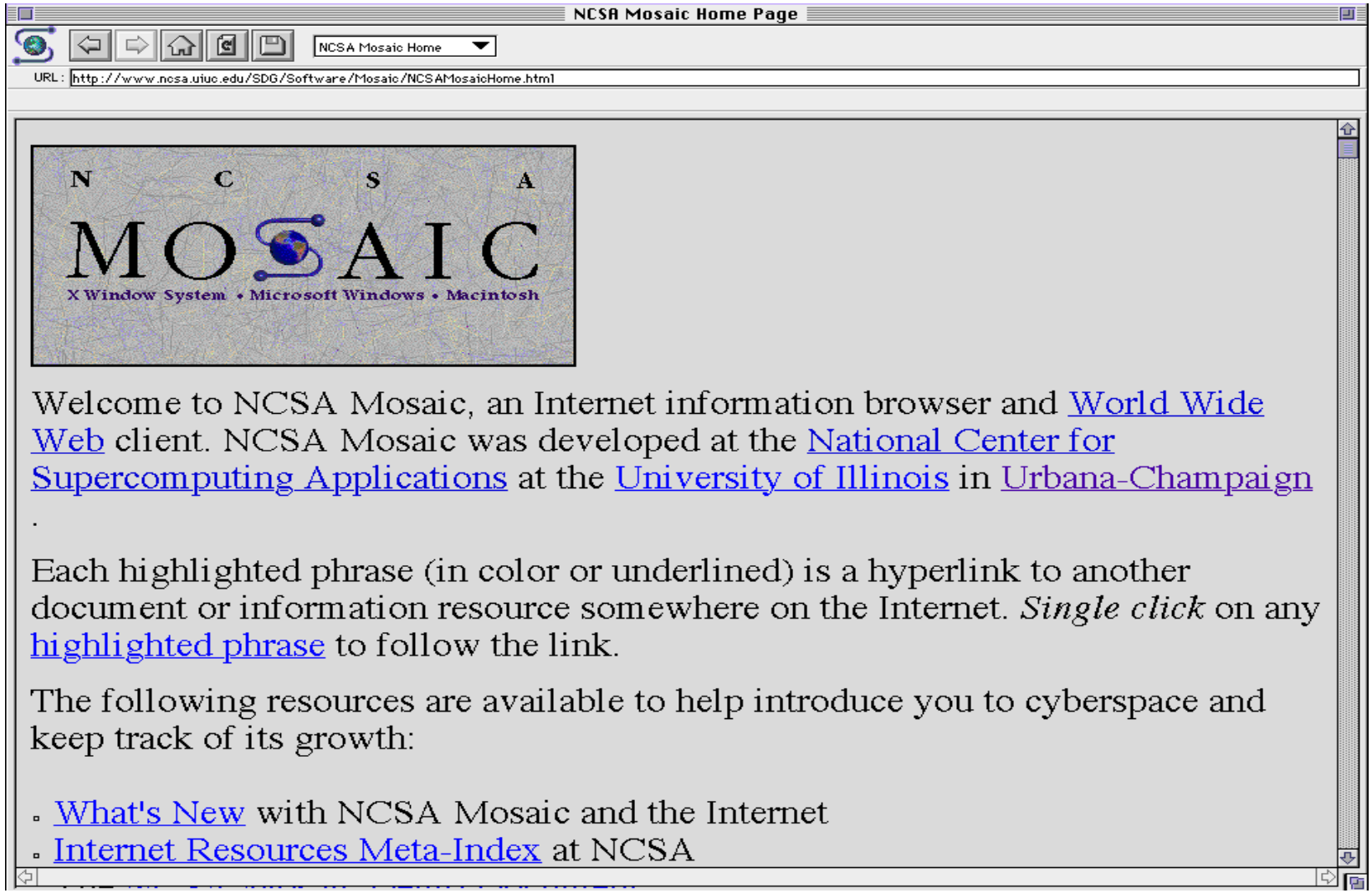
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The Universality of Client-Server



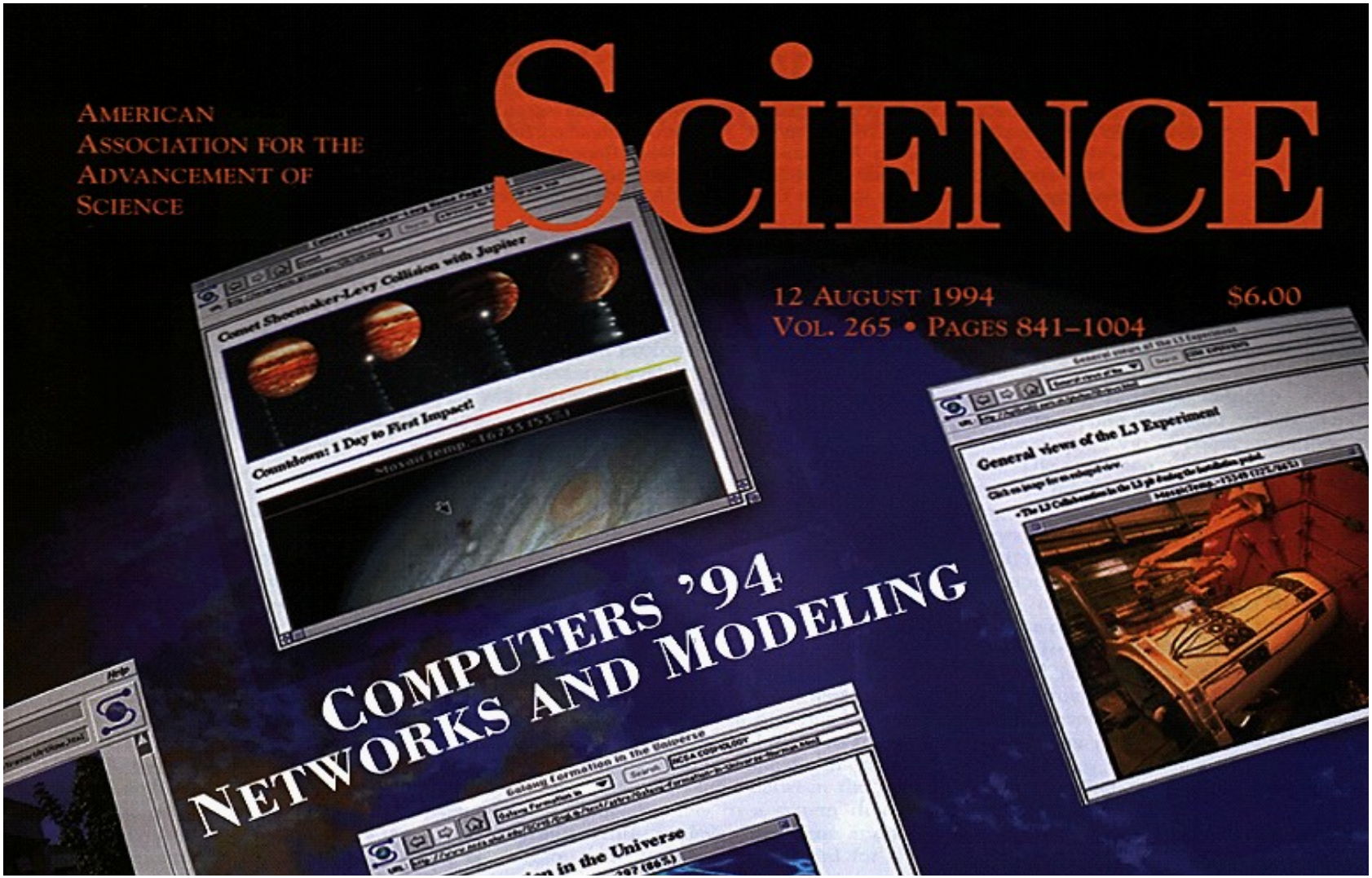
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NCSA Mosaic Home Page



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Schatz and Hardin Science Article on NCSA Mosaic and the World Wide Web



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Mosaic/WWW
Hiding the Internet

- Cross platform user interface
- Global hypermedia
  - –Interlinked documents
  - –Hypertext Markup Language (HTML)
- Universal Resource Locator (URL)
- Database queries and index searching
- Remote log in
- Hypertext Transfer Protocol (HTTP)
- Multimedia viewers

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NCSA Mosaic
A Client for All Servers

- Gopher
- Usenet
- Wide-Area Information Server (WAIS)
- Anonymous File Transfer Protocol (FTP)
- World Wide Web (WWW)

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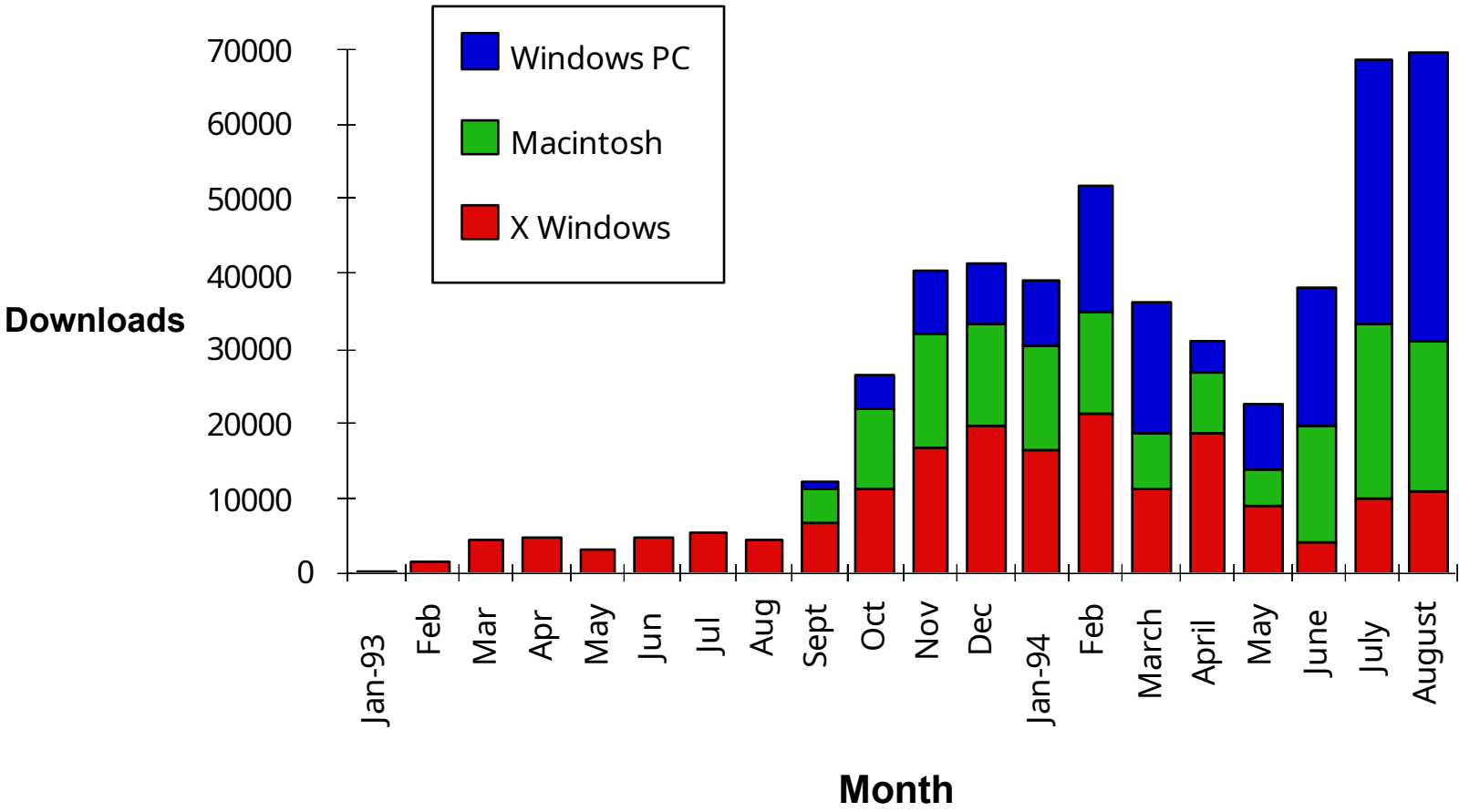
Mosaic – WWW
An Out-of-Control Groupware

"A few weeks ago, in reviewing the "metrics" of the Internet at the Society, we found that all measures of the network and its use continued to scale inexorably: ever more connected countries, gateways, networks, hosts, users, services and traffic. A network analyst recently noted that if one of those services – the World Wide Web – continues its traffic increase at present rates, it will exceed the world's digitized voice traffic in three years. We are now watching a global internetworking revolution scale in near real-time. Every thirty minutes, another network connects."

– Anthony M. Rutkowski
Executive Director, Internet Society
Interop 94 keynote
http://info.isoc.org/interop-tokyo.html

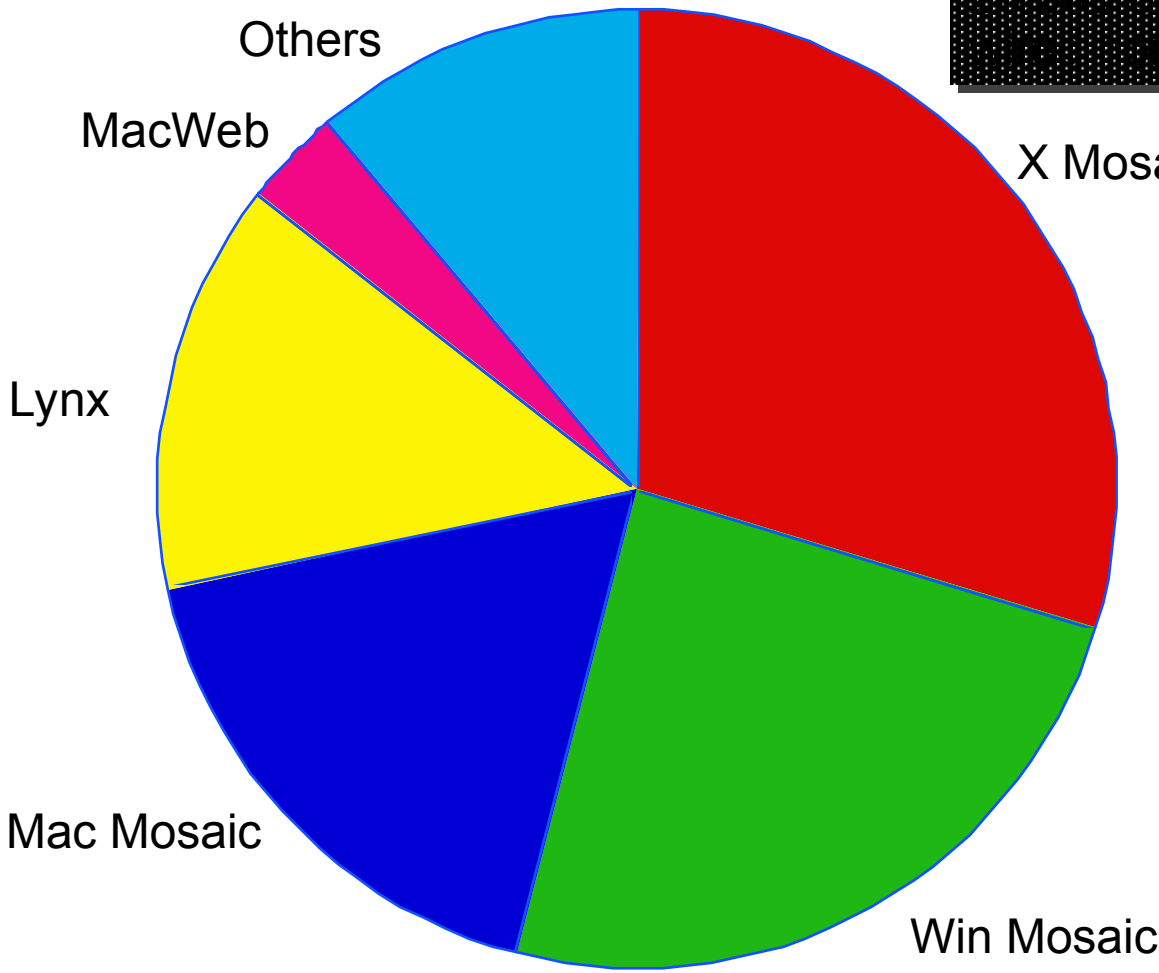
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NCSA Mosaic Software
FTP Server Downloads



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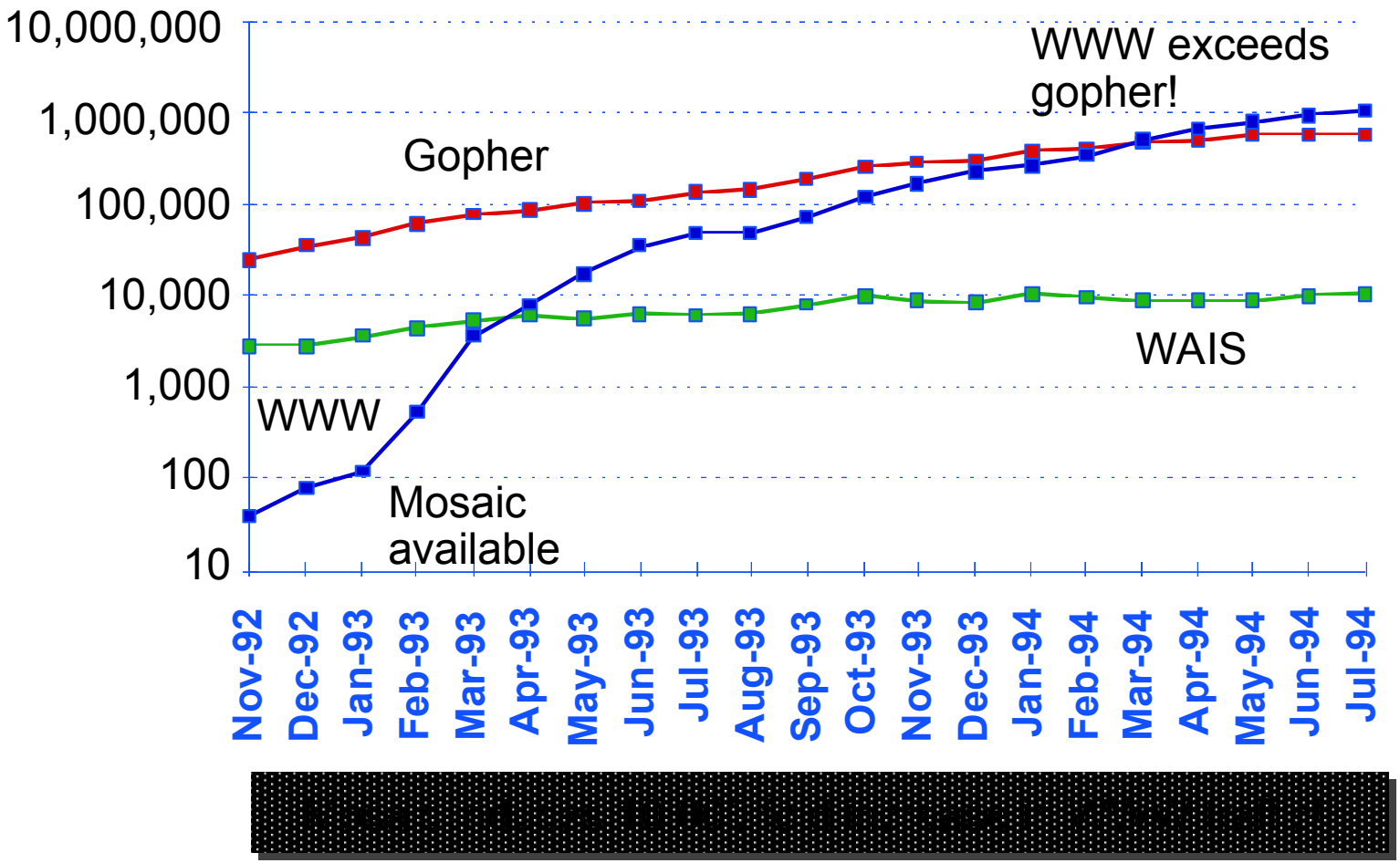
Popularity of WWW Clients



71% used NCSA Mosaic

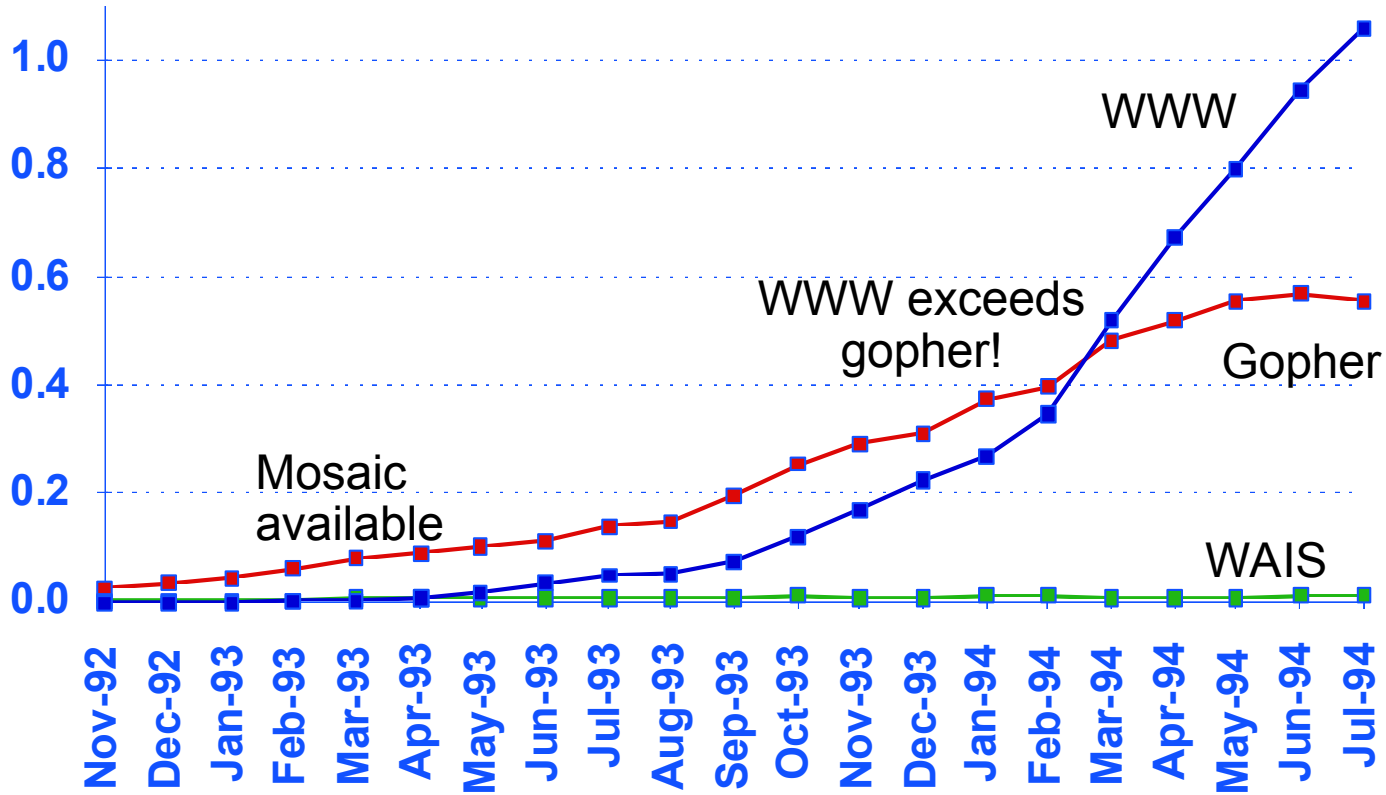
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Exponential Growth of Clients Coupling to Servers



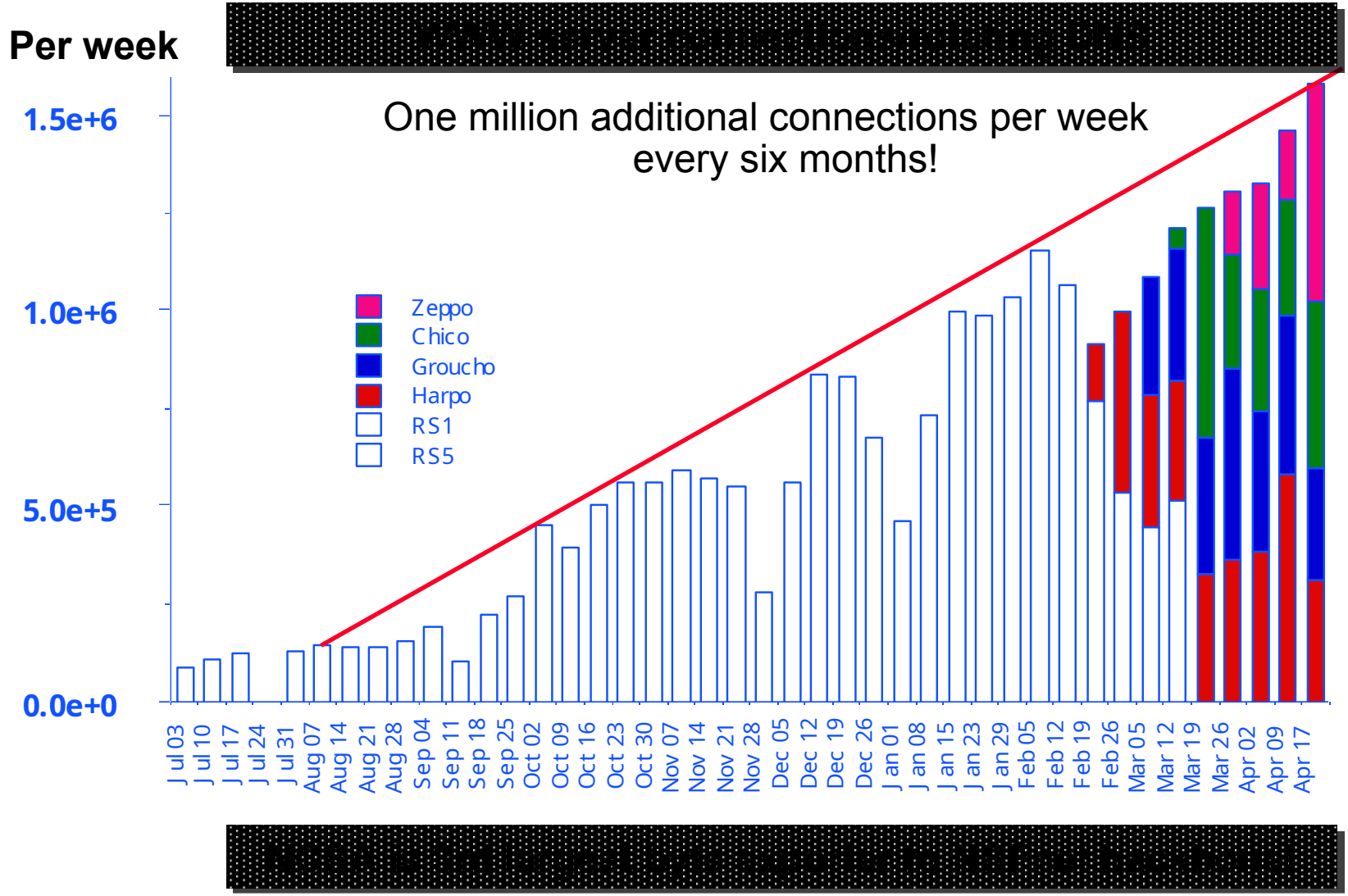
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Hypermedia Traffic Exceeds a Terabyte Per Month!



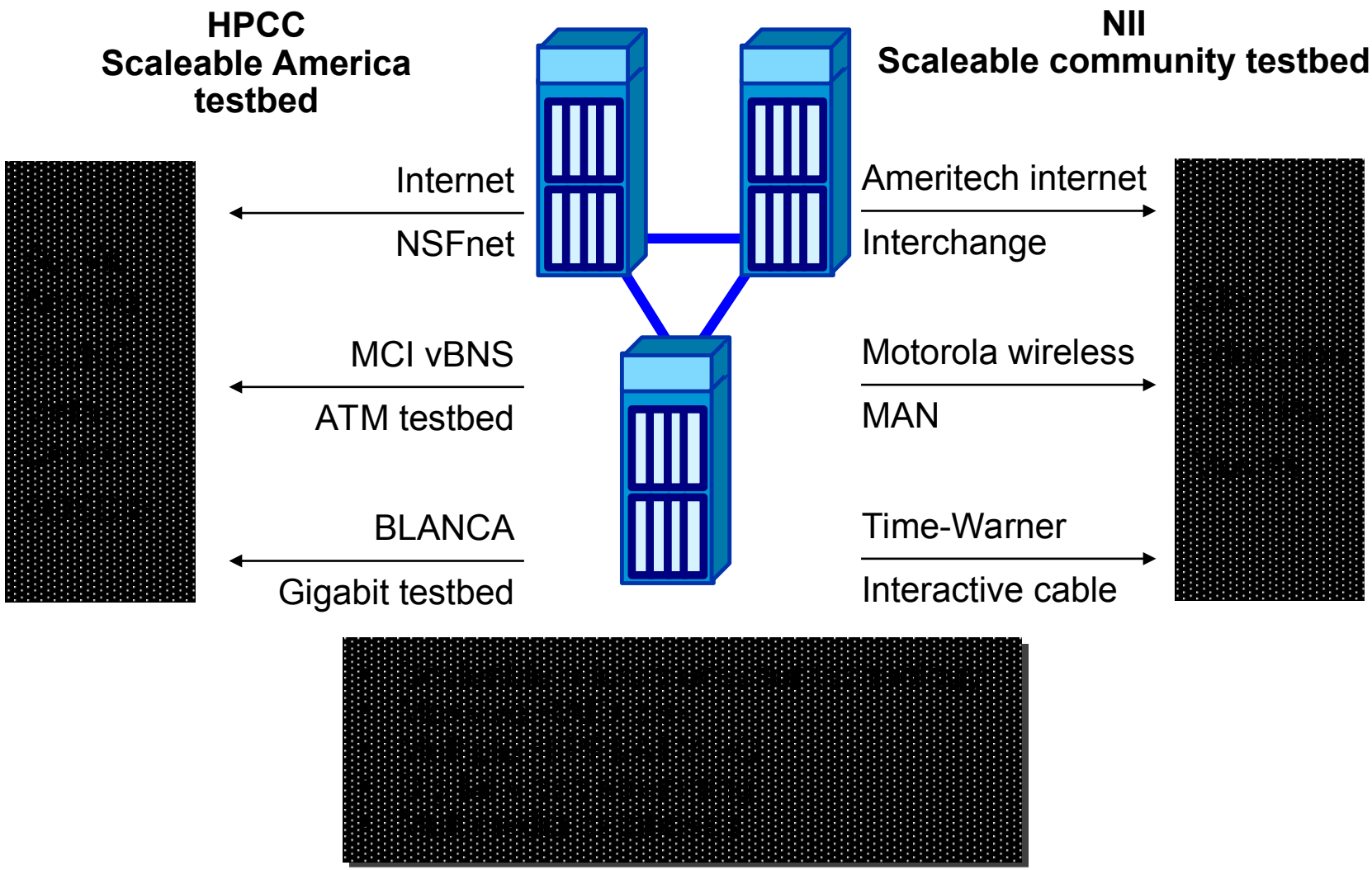
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Transition to Scaleable Infoservers



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Proposed Scaleable Multimedia Infoserver



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InfoWorld 1994 Products of the Year

Client/server becomes reality

- Readers and editors name top products for enterprisewide solutions



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Commercial Licensing of NCSA Mosaic

- Fully executed licenses
  - –Spyglass, Inc. – Master Licensing Agreement
  - –InfoSeek Corporation
  - –Quadralay Corporation
  - –Quarterdeck Office Systems, Inc.
  - –Santa Cruz Operation, Inc.
  - –Spry, Inc.
  - –Fujitsu Inc.
  - –Amdahl
  - –EPRI
  - –Ubique

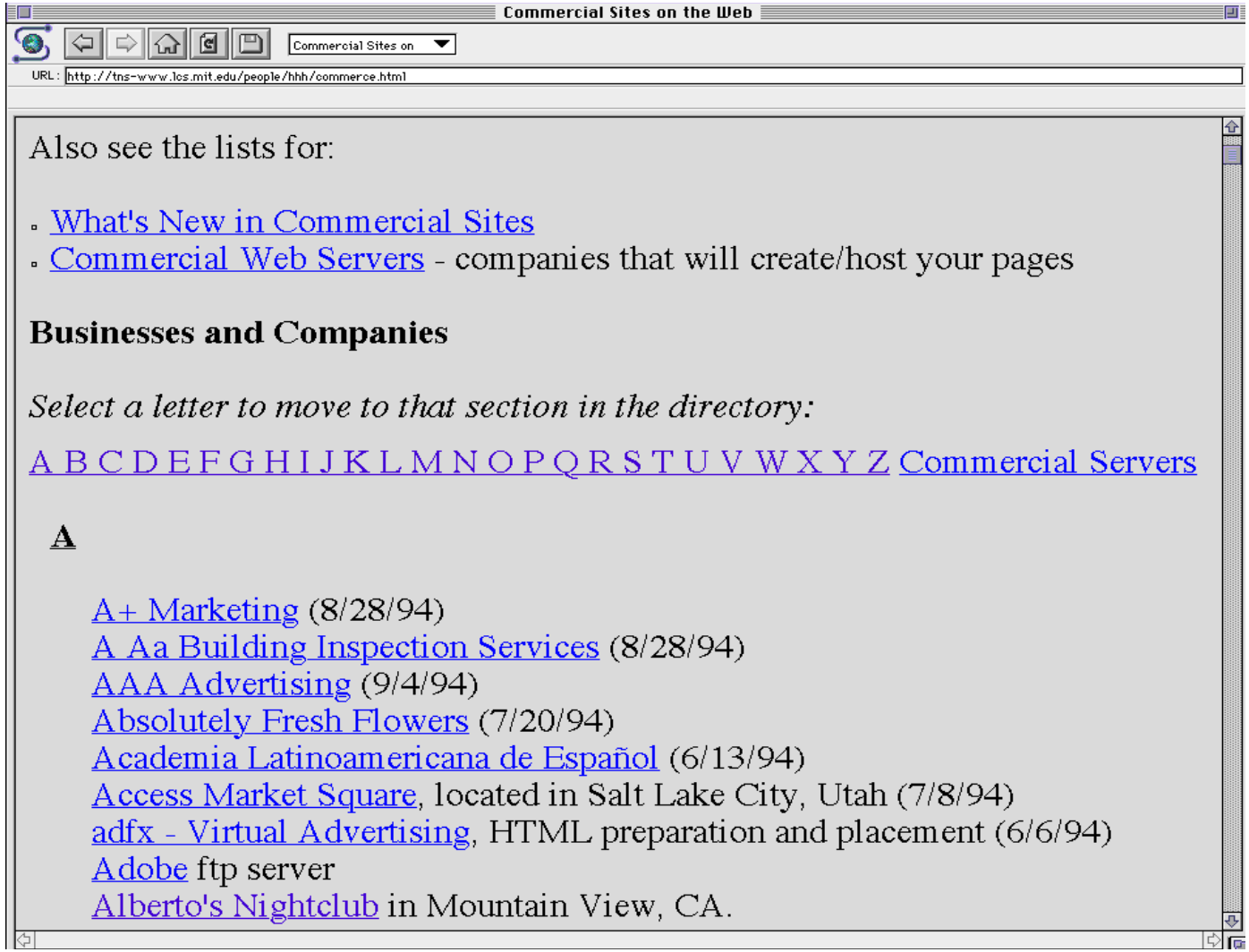
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Mosaic/WWW Enables Collaboration
Groupware as Societyware

- Company – customer
- Staff – staff
- Researcher – researcher
- Government – citizen
- Community – citizen
- Student – student
- Country – tourist

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MIT Commercial Sites on the Web Server



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Digital Equipment's Information Server



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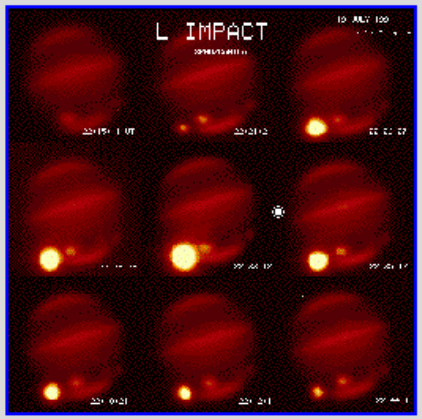
JPL Comet Collision with Jupiter Server

Comet Shoemaker-Levy Home Page (JPL)

Comet

URL : http://newproducts.jpl.nasa.gov/s19/s19.html

Comet Shoemaker-Levy Collision with Jupiter



San Piedro Martir Observatory, Mexico
July 19, 1994

From July 16 through July 22, 1994, pieces of an object designated as Comet P/Shoemaker-Levy 9 collided with Jupiter. This is the first collision of two solar system bodies ever to be observed, and the effects of the comet impacts on

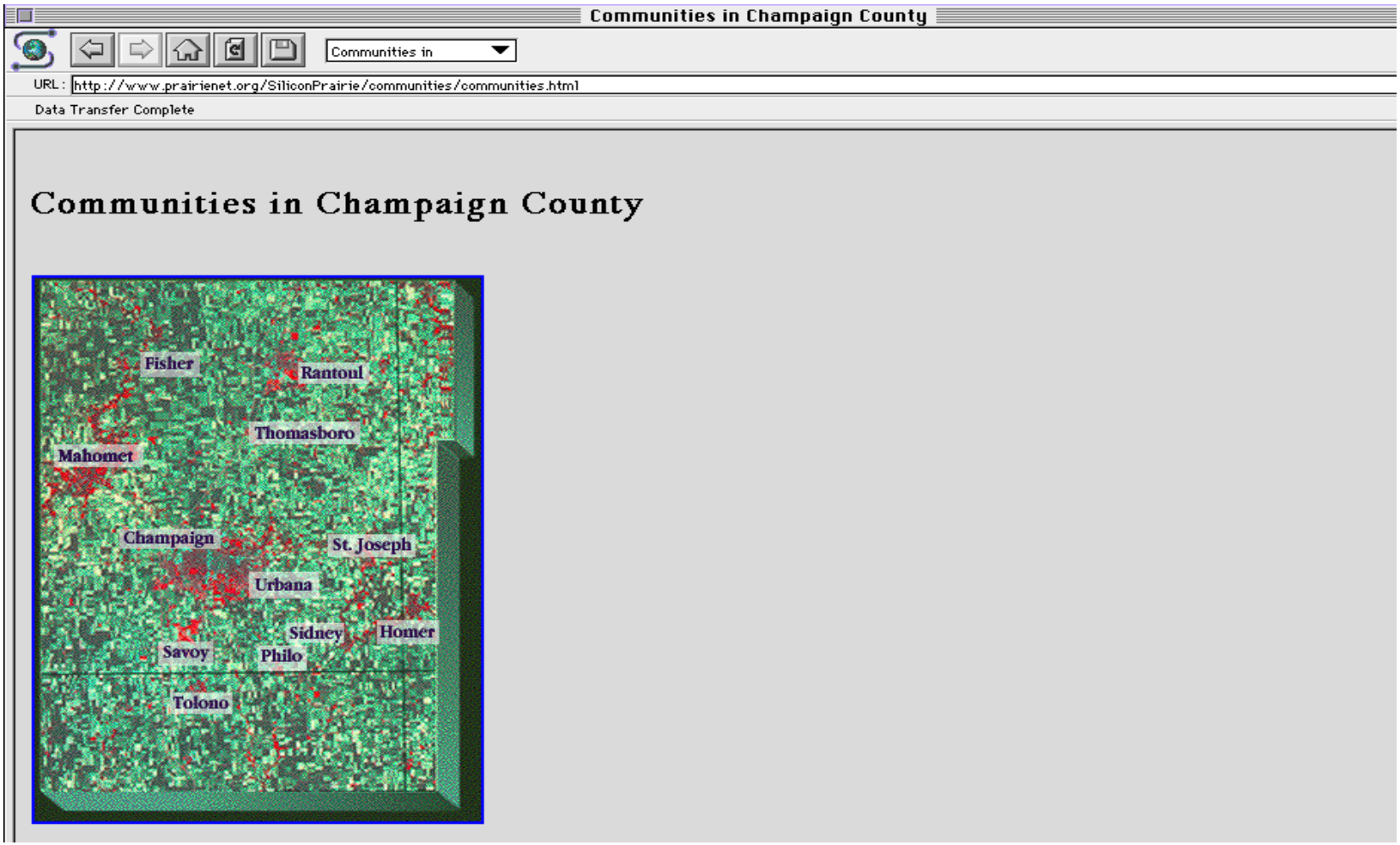
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Champaign County, Illinois
Mosaic Home Page



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Remote Sensing View of Champaign County



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Tolono, Illinois
Mosaic Home Page

Tolono, Illinois

Tolono , Illinois

URL : http://www.prairienet.org/SiliconPrairie/communities/tolono/tolono.html

Welcome to the Village of Tolono, Illinois



Tolono, located eight miles south of Champaign, has a small town atmosphere with large town convenience. It is known as the last place where Abraham Lincoln stopped and gave a speech on his way to Washington, D.C. to assume the Presidency. Tolono is very proud of its ever-expanding public library, which is totally computerized. They are equally proud of their many stately old homes, many of which are on the historic register.

Click here for a map of Tolono, Illinois. Courtesy of DeLorme Mapping

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Illinois State Fair
Mosaic Home Page



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Mosaic University High School Art Space

Drawings . . .

Color Pencil Still Life Drawings:

- Ellen Wheeler, 1991
- Shira Wachtel, 1991

Architecture Projects by Subfreshmen:

- Design an Underwater Environment
- Design an Future Dwelling

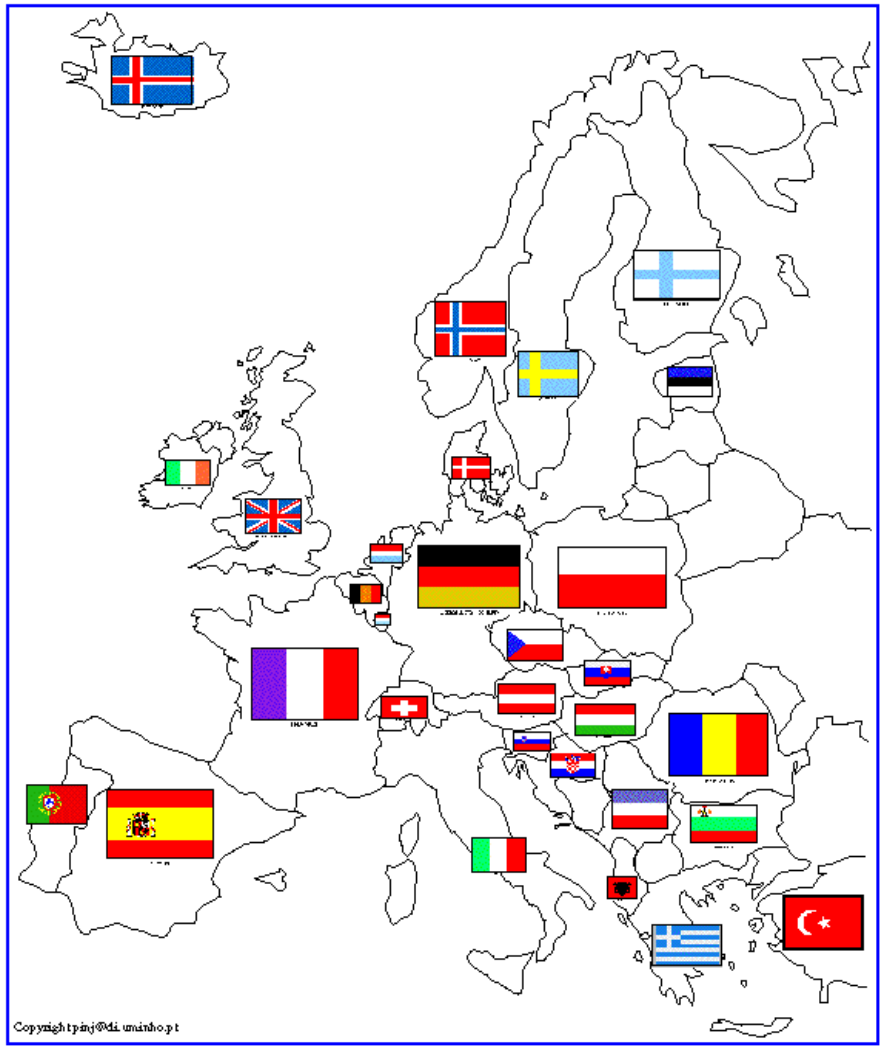
Self-Portraits, Art One:

- Noura Sharabash, 1992
- Hanady Sharabash, 1993
- Leif Christianson, 1993
- Morgan Finch, 1993
- Andrew Nicholson, 1993
- Asako K-L., 1992
- Shannon Wright, 1993
- Nasri Hajj, 1993
- Melanie Adcock, 1992



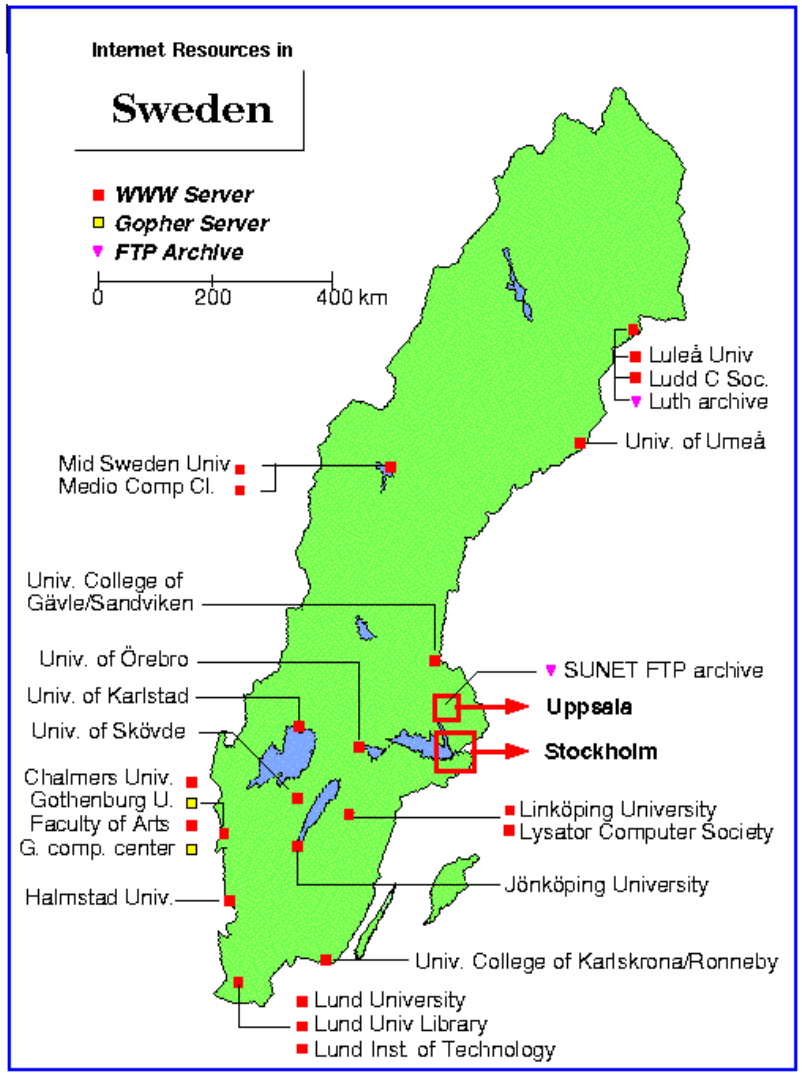
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Mosaic European Home Page



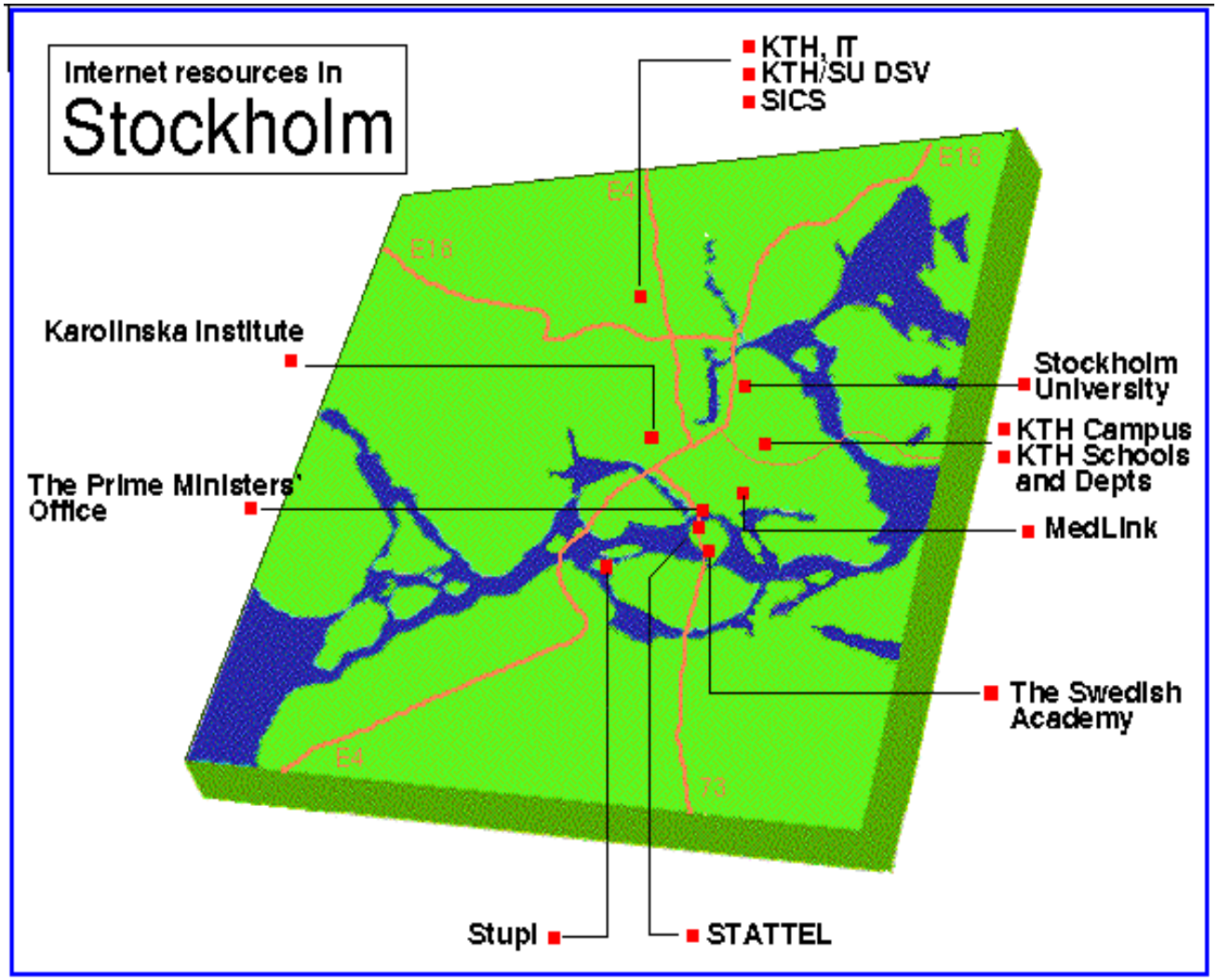
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Mosaic Sweden Home Page



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Mosaic Stockholm Home Page



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Mosaic Swedish Academy Home Page

SVENSKA AKADEMIEN

FACTS ABOUT THE SWEDISH ACADEMY

(Svensk version.)



* History



* Members



* Organisation and projects

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How to Find What You Need in Cyberspace

- Today
  - –What's new page
  - –Usenet discussions
  - –E-mail your friends
  - –Sharing of hotlists
  - –Individual creates global catalog

- Tomorrow
  - –Automatic catalog creation
  - –Global searching
  - –Intelligent agents
  - –Building your personal information space

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Mosaic/WWW System Issues

- Scaleability
- Reader ⟷ author feedback loops
- Decentralization vs. coherence
- Collaborative development
- Local and global searching
- Commercialization

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Mosaic Future Developments

- Security/copyright/financial transactions
- User authoring tools for hypermedia
- Highly structured documents
- Workgroup collaboration
- Geographic information systems integration
- Full motion video serving
- Cross-platform server development
- Global indexing and search
- Personal information agents
- Client communications interface

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Client Communications Interface
Enabling Groupware

- Any current application domain now Web-capable
  - –Document processors, spreadsheets, CAD, e-mail …
- Sequencers/session scripting
- Stand-alongside helpers, not just viewers
- Network financial transaction assistants
- Collaborative development effort
  - –Joint specification development with Spyglass
  - –Requirements: SoftQuad, Motorola, Adobe, Harvard ADS, SCO/IXI, DigiCash, NIST, OCLC, CMU, CNRI

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Highly Structured Documents

- Math, Sciences, Humanities

- SGML:
  - –Viewer and DTDs from SoftQuad
  - –Style sheets for layout control
  - –Their main product line
  - –OCLC equation rendering
  - –Major use of CCI

- Adobe Acrobat Viewer
  - –Acrobat hyperlinks extend to the Web
  - –Major use of CCI

- HTML extensions

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Standards
Foundations of NII

- URN – URL abstraction
- URC – standard resource citations
- HTML++ – enhanced hypertext/media/SGML
- HTTP – transport development/optimization
- Z39.50/WAIS – emerging standard
- NCSA Mosaic CCI – application integration

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University of Illinois Digital Library Testbed

- Bruce Schatz, PI, NSF/ARPA/NASA RFP
  - –Proposed for $1 million a year for 4 years
- University Library and Grainger Center
- Library and Info Sciences and Computer Science
- Industrial Partners
- NCSA-Mosaic + display and search
- Users – UIUC (Illinois) and CICnet (Midwest)
- Digital collections
  - –Engineering journals/magazines
  - –Scientific databases
- Research directions
  - –Semantic retrieval
  - –Sociological evaluation

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Two Styles of Groupware

- Synchronous
- Asynchronous

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Asynchronous Collaboration
Toward HyperMediated Discussions

- E-mail

- News groups
  - –Bulletin boards and discussion forums
  - –Usenet
  - –Hypernews

- Mosaic/WWW
  - –Response trees and annotations
  - –Adding Hyperlinks to existing server content
  - –Creation of new servers

- Utilizing research testbeds
  - –UIUC Engineering Digital Library
  - –Community Testbeds-CCNet
  - –NASA CAN HDF archives

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Synchronous Collaboration
Toward Digital Real-Time Conferencing

- Building on NCSA Collage
  - –Shared multimedia eorkspace
  - –Cross platform interactivity
  - –Common white board
  - –Multiple remote users simultaneously

- Integration with NCSA Mosaic CCI

- Desktop video teleconferencing windows

- Utilizing research testbeds
  - –University of Michigan NSF UARC project
  - –NASA Education (Gonzaga College High School)
  - –Weather Co-Vis High School

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