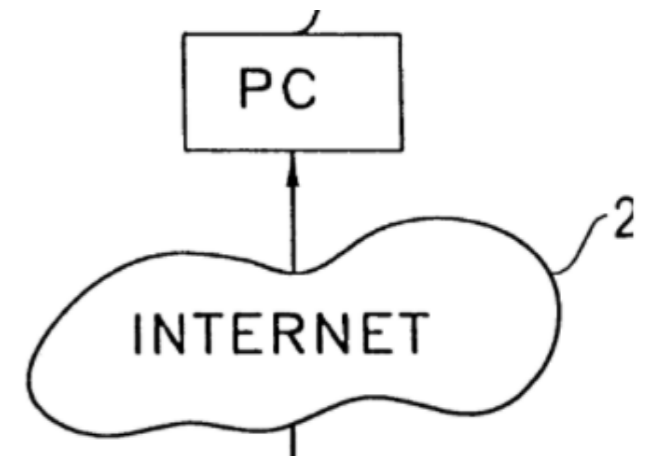
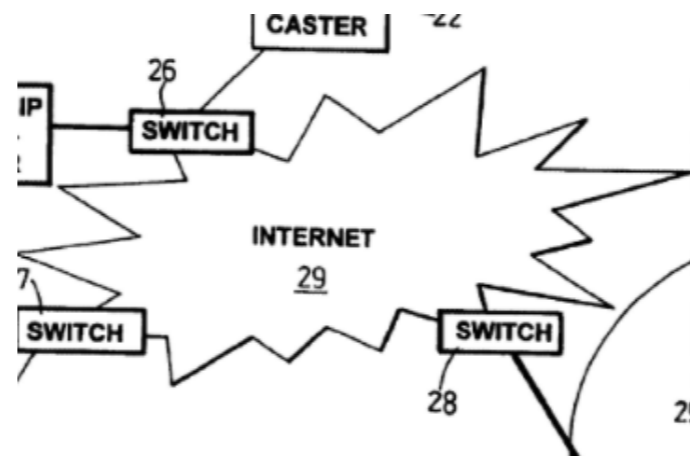
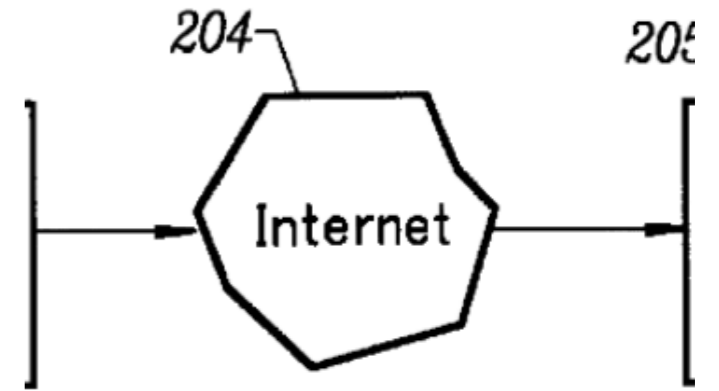
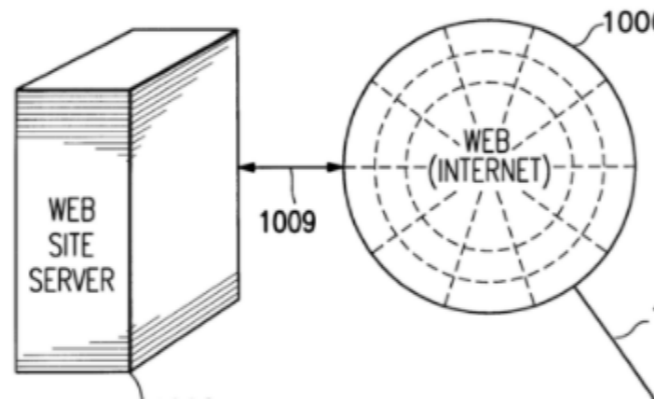
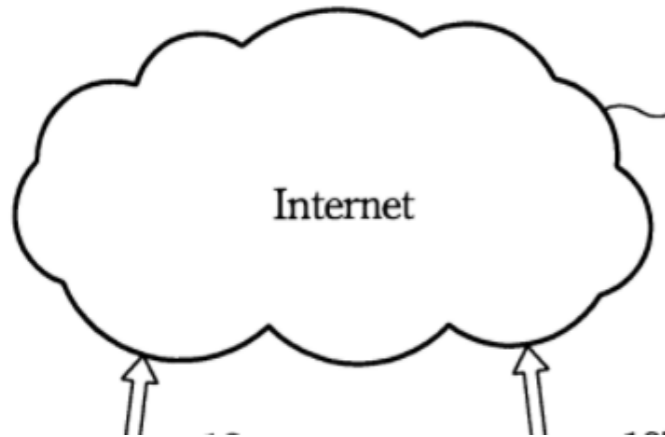
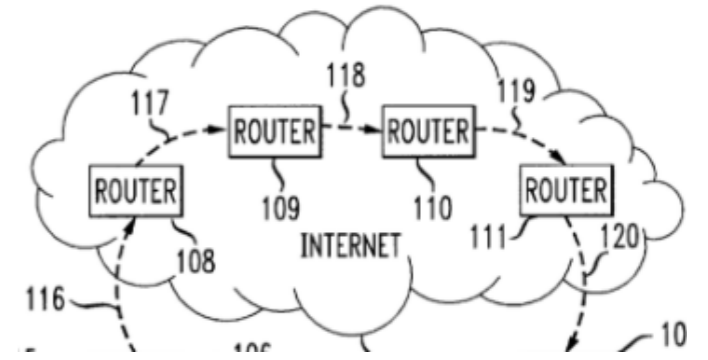


FIG. 1



January 18, 2019

A History of the Internet

Laurel Schwulst
Art369b: Interactive Design and the Internet



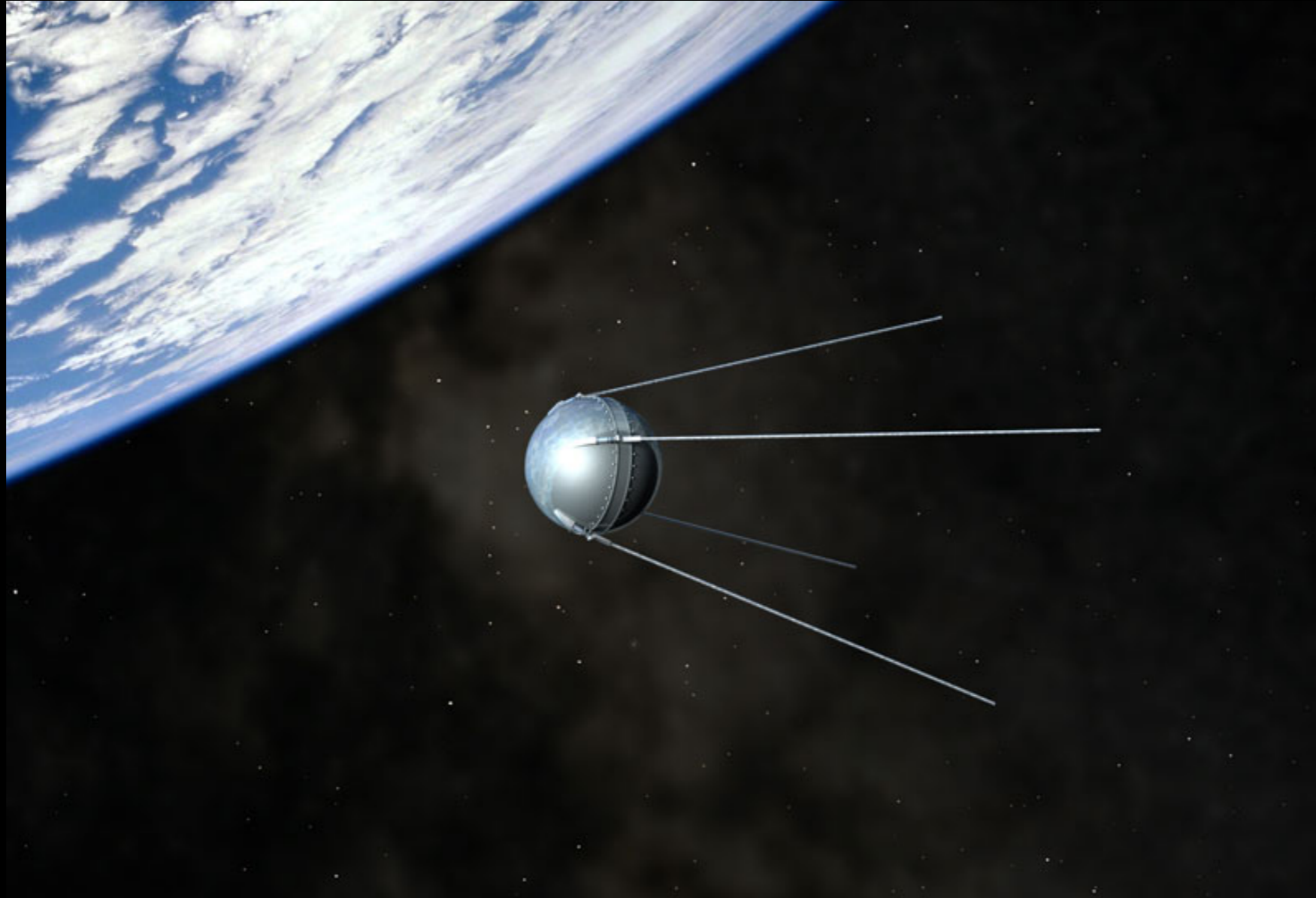
1830s-50s

A NEW MAP of the SUBMARINE CABLES connecting the World, according to the best Authorities with all the latest Discoveries to the PRESENT PERIOD, 2015.



First submarine cables for the telegraph

1957



Sputnik

1957



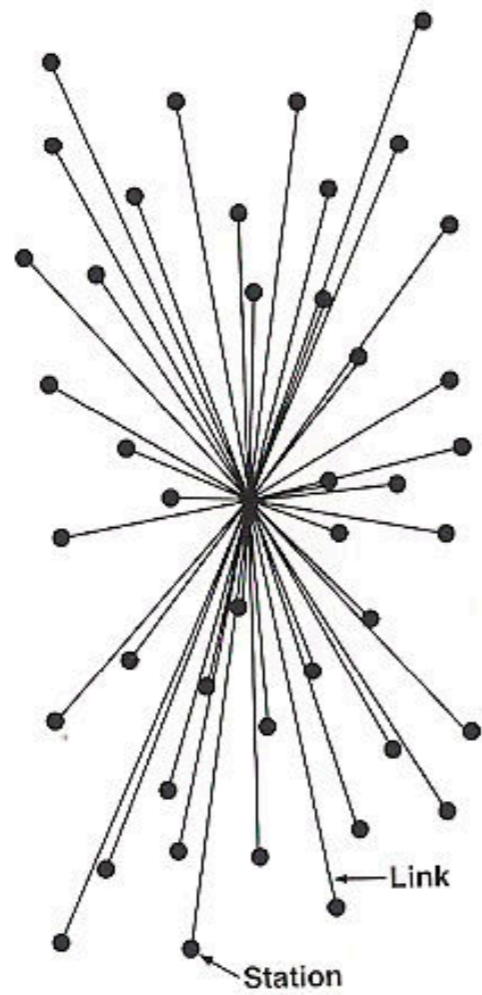
Sputnik



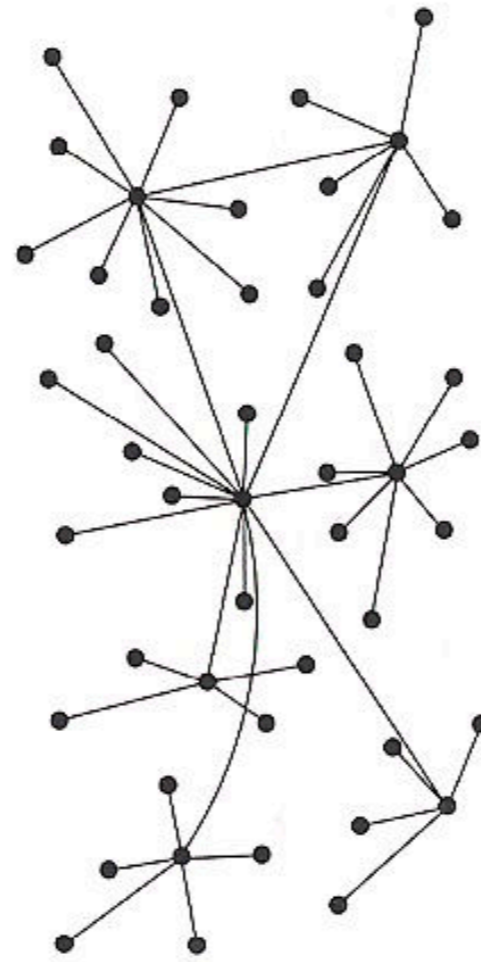
DARPA

<https://www.darpa.mil>

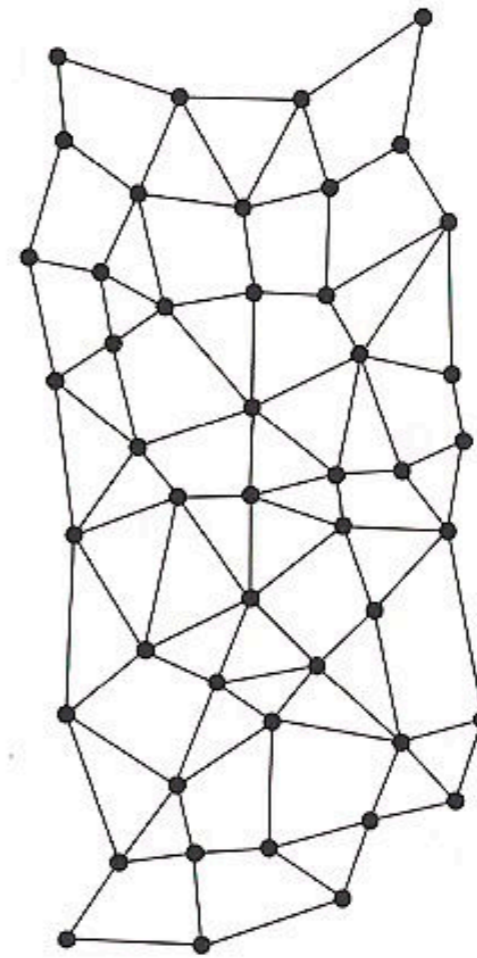




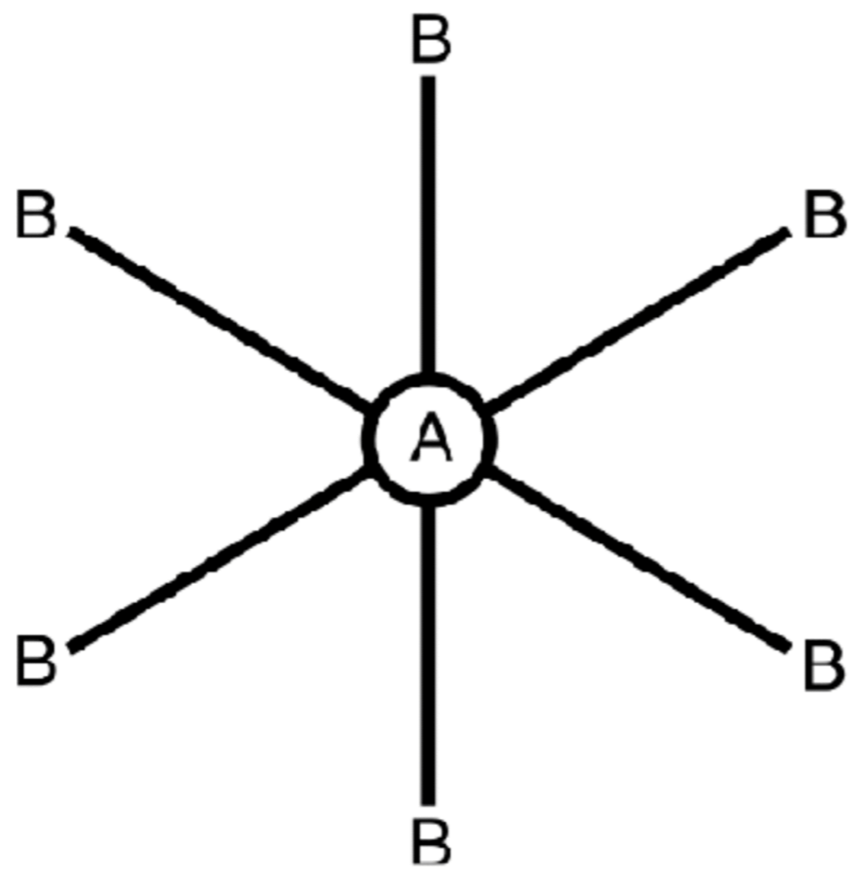
CENTRALIZED
(A)



DECENTRALIZED
(B)

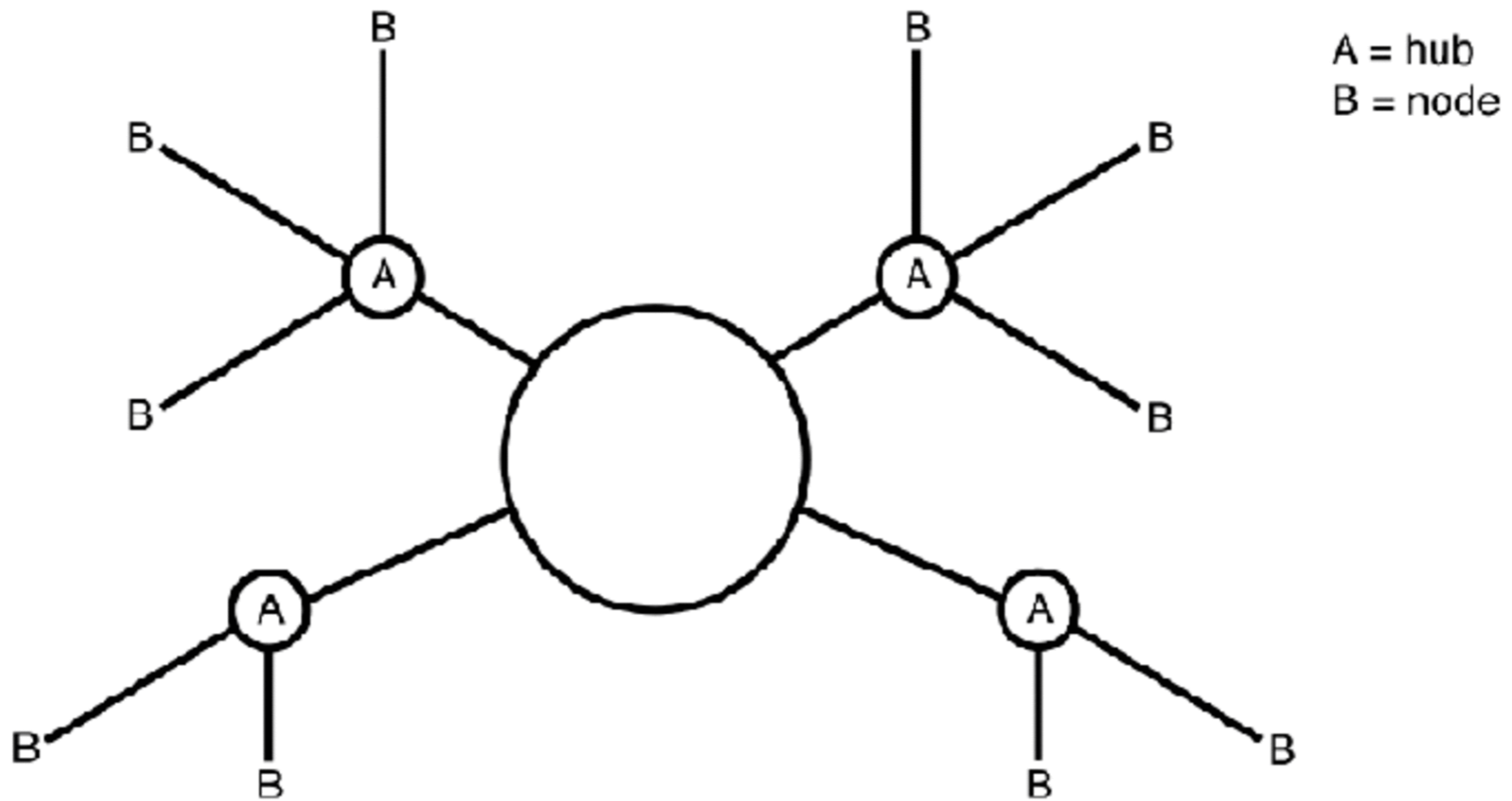


DISTRIBUTED
(C)

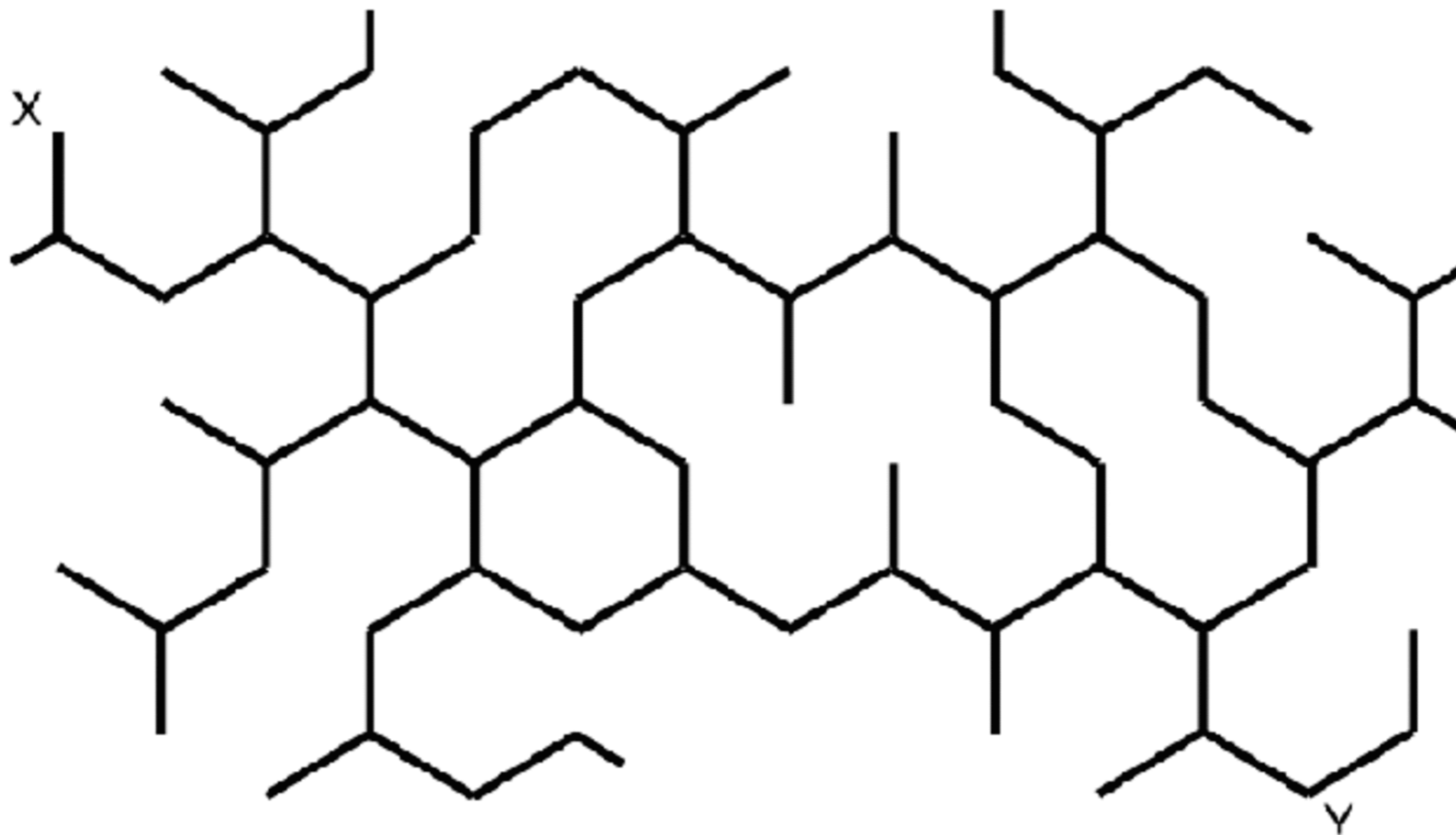


A = hub
B = node

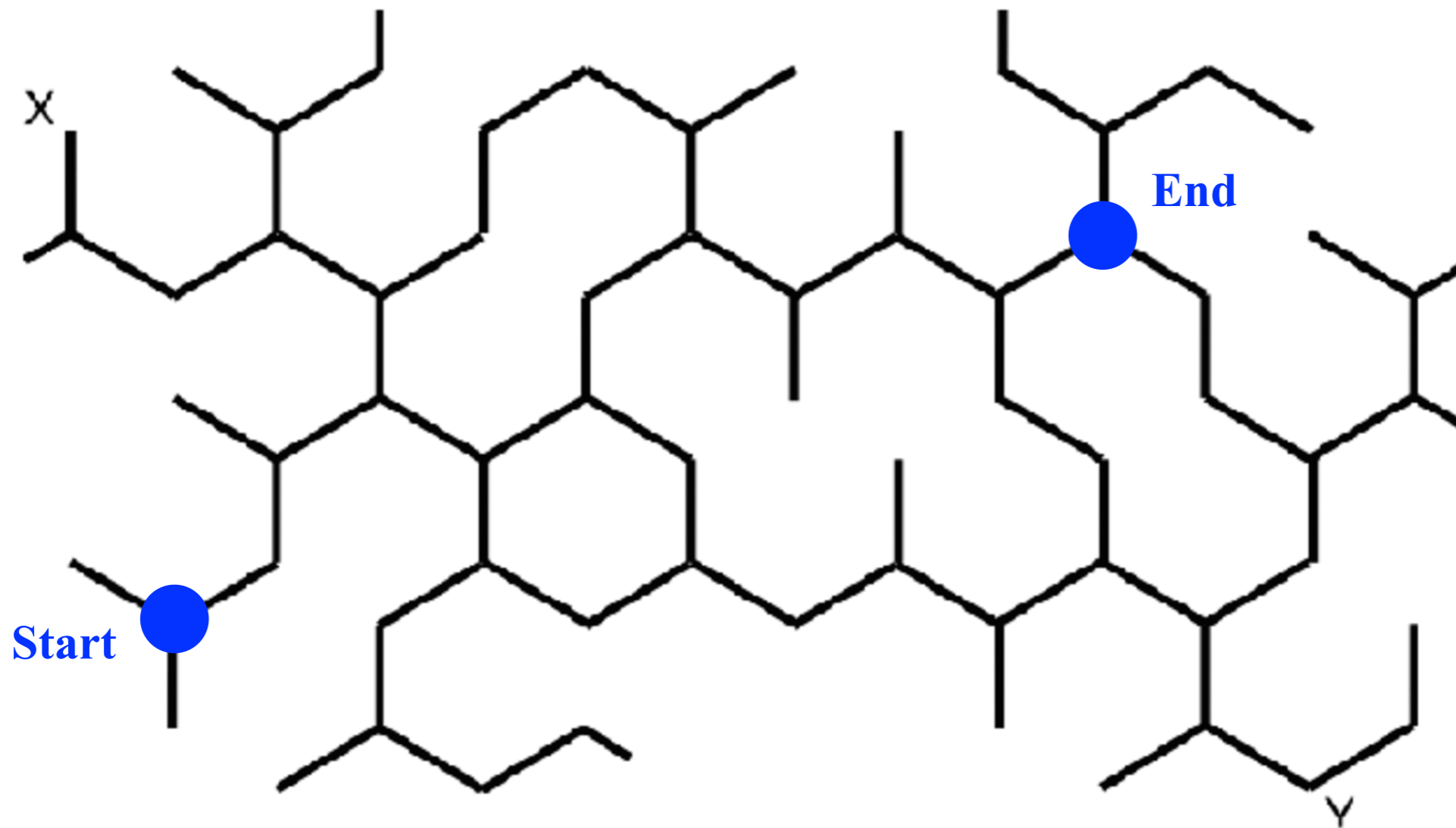
Centralized network diagram



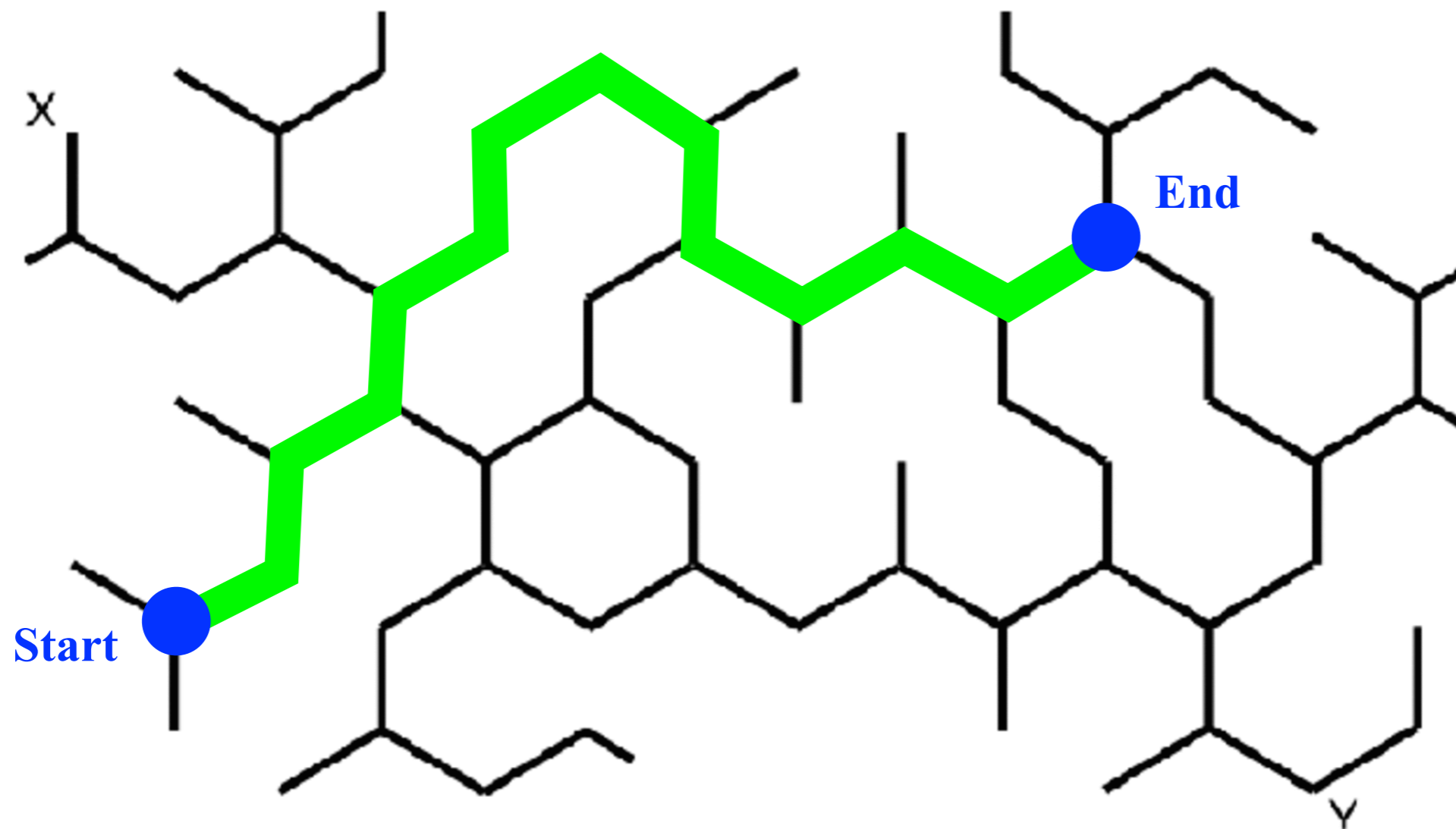
Decentralized network diagram



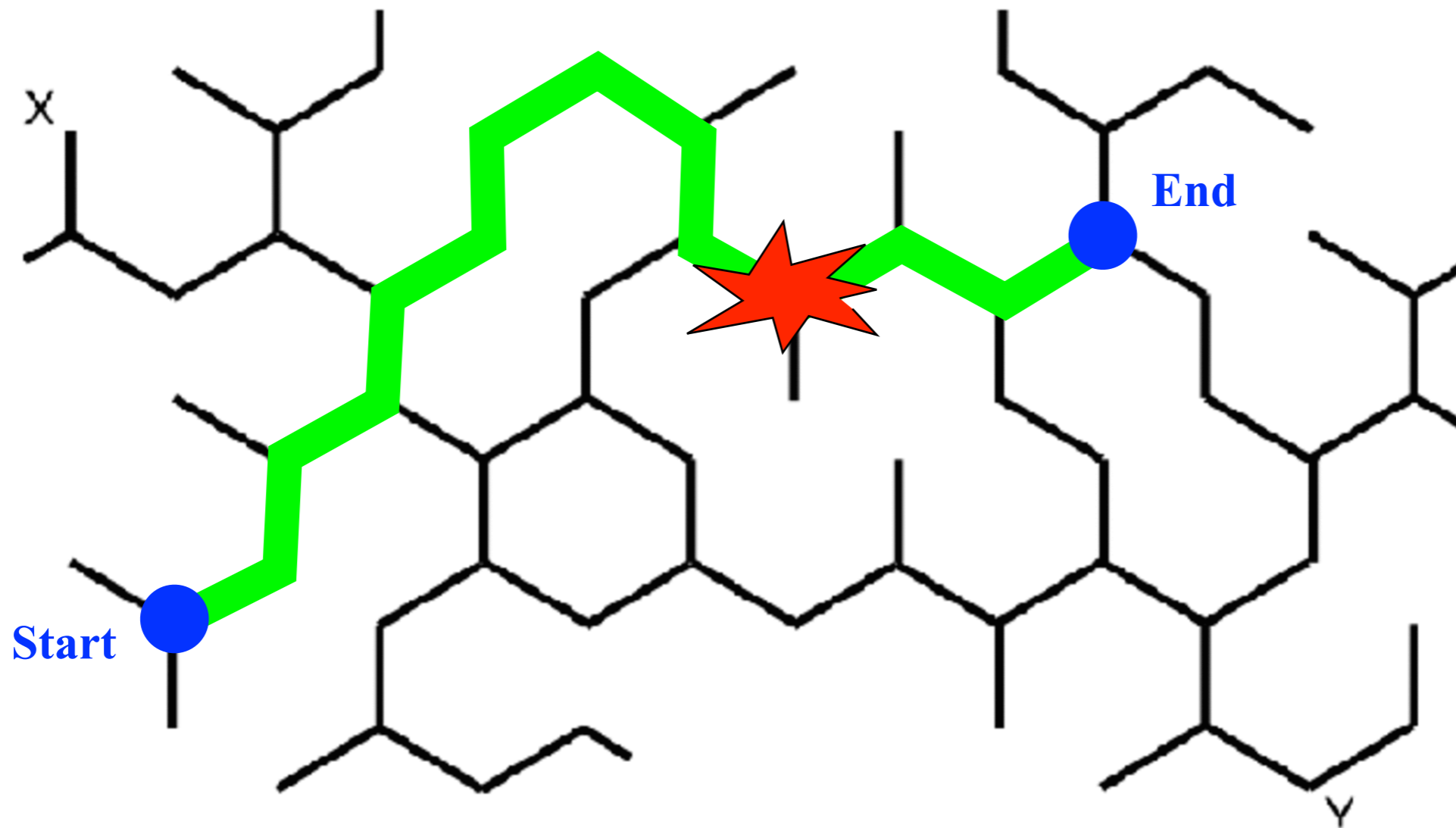
Distributed network diagram



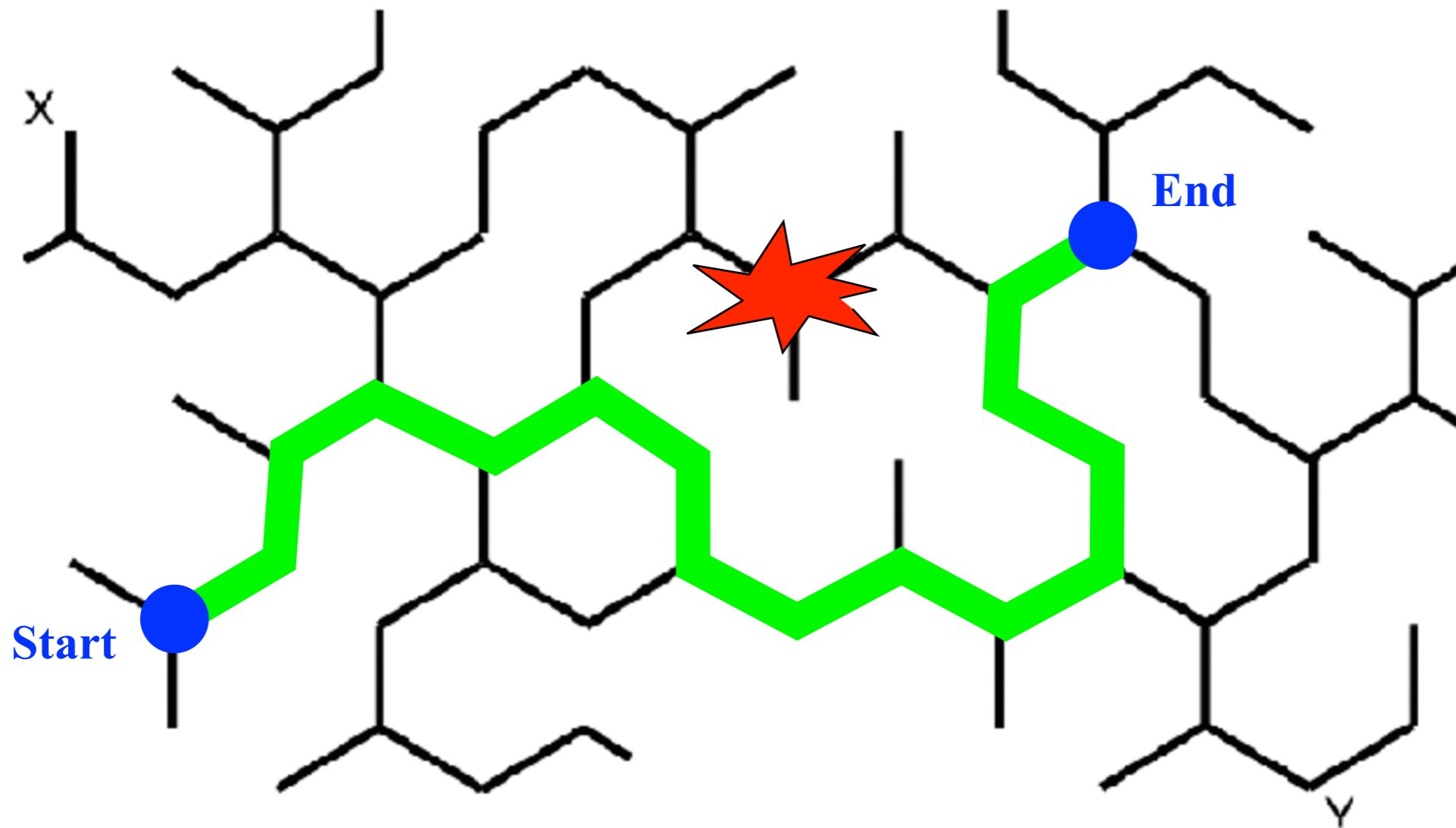
Distributed network diagram



Distributed network diagram

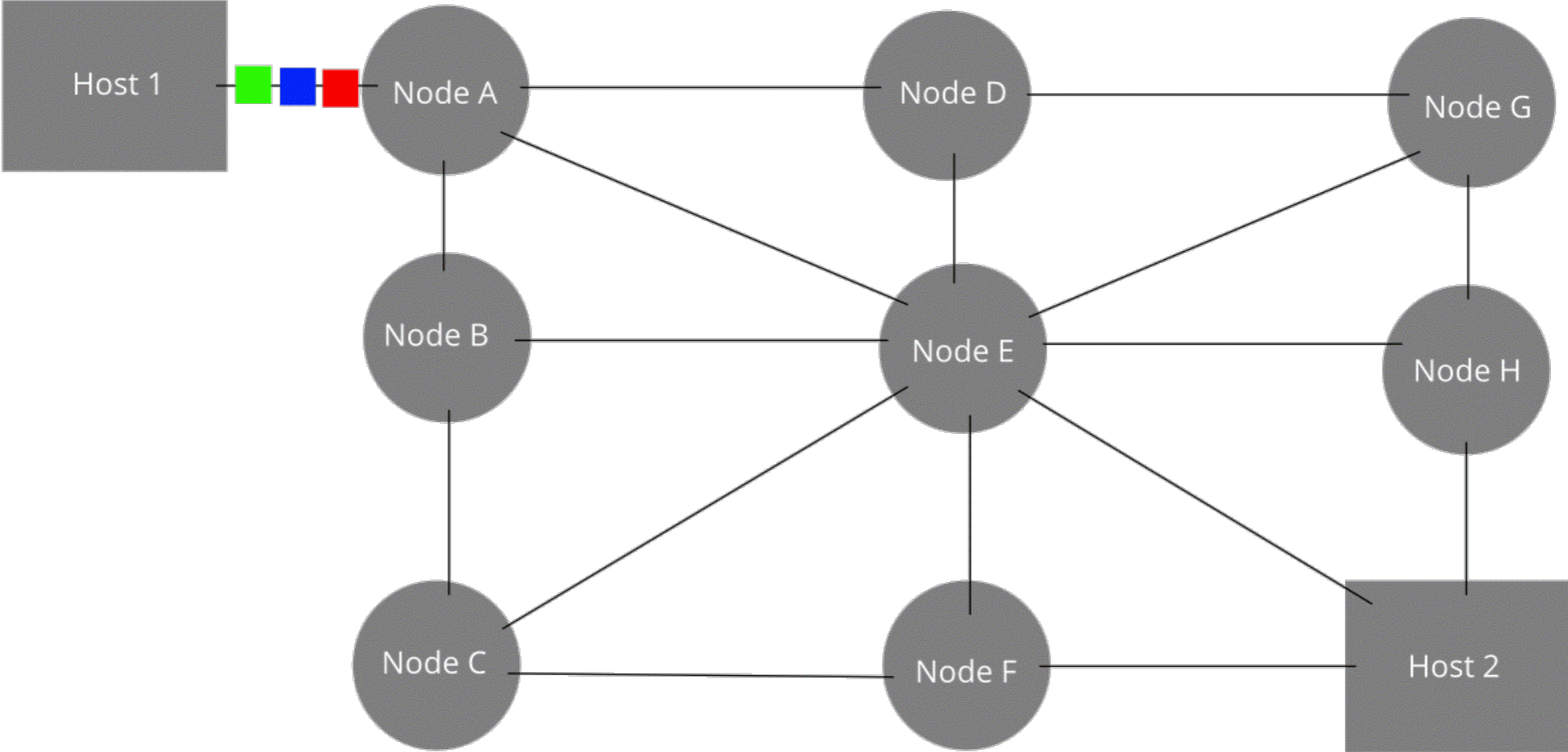


Distributed network diagram



Distributed network diagram

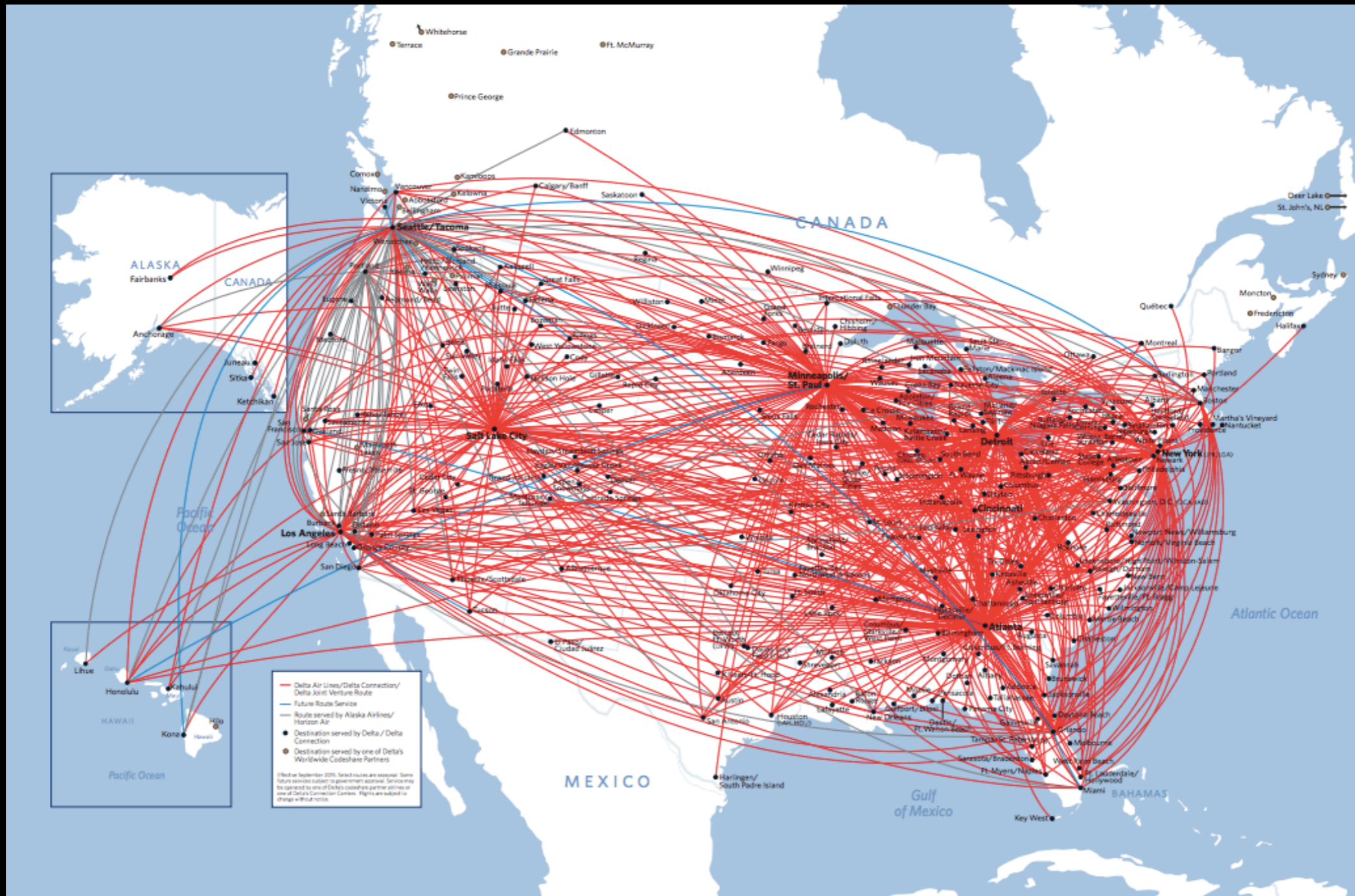
The original message is Green, Blue, Red.



Packet switching

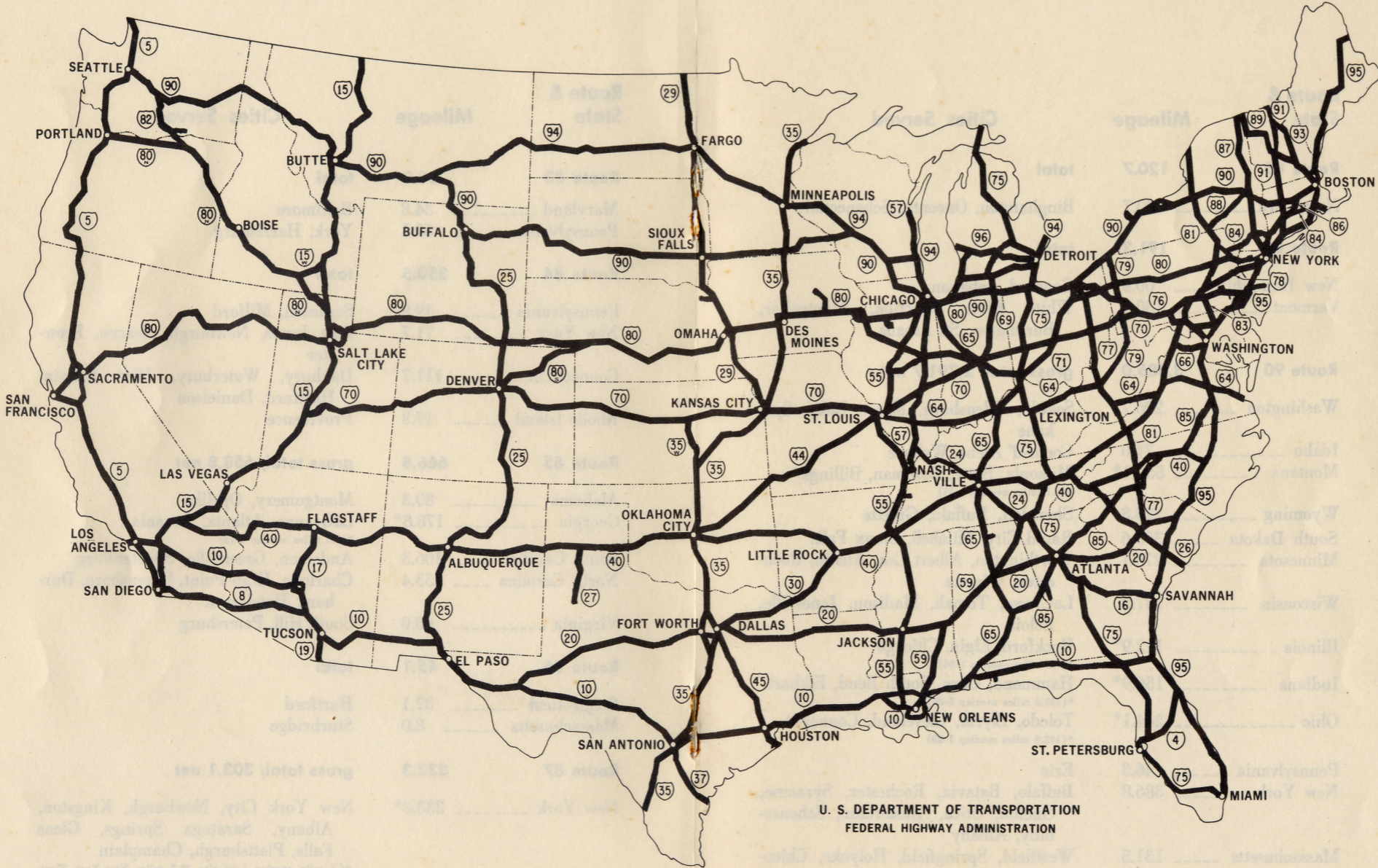


Panopticon



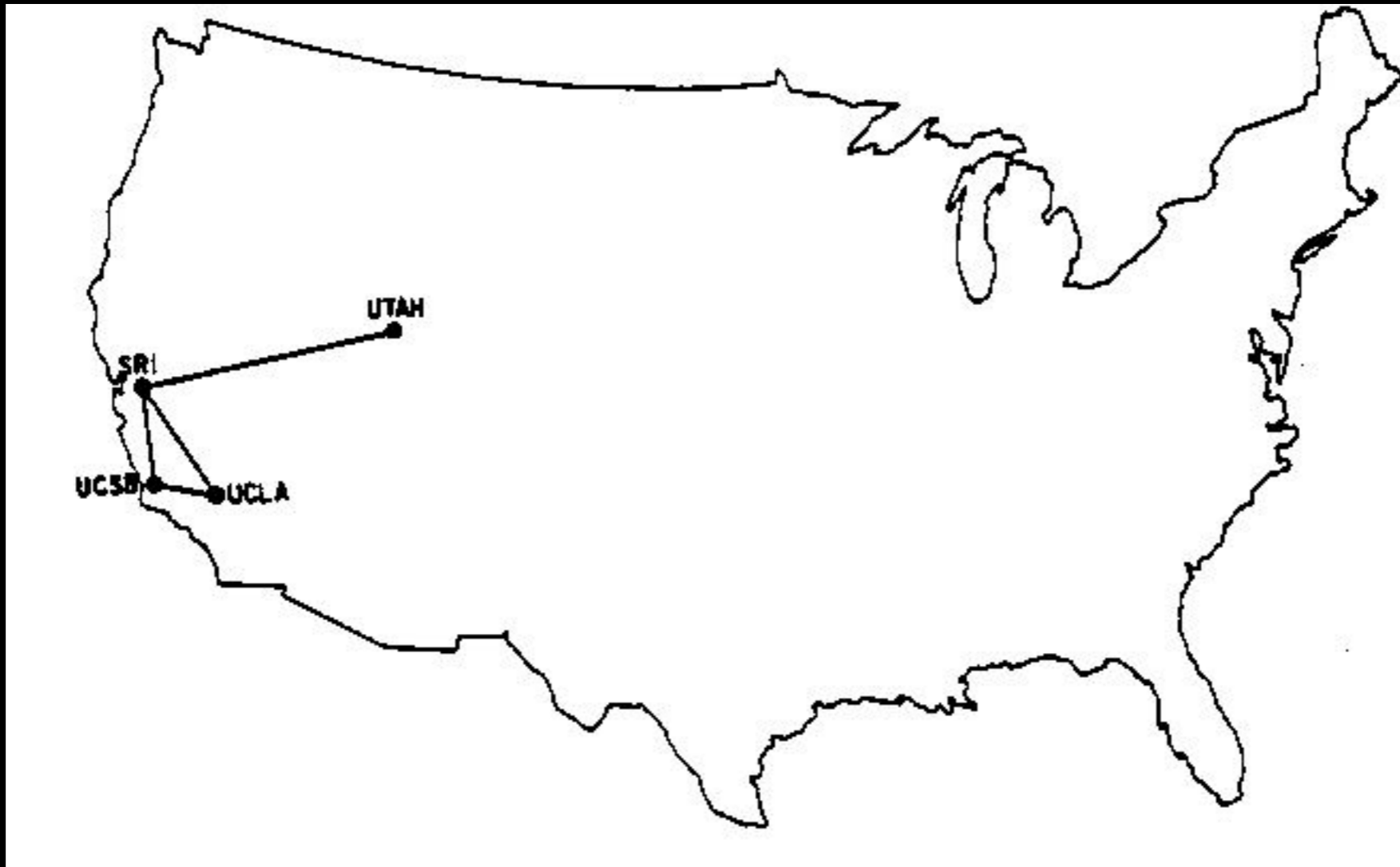
Air Travel Routes

THE NATIONAL SYSTEM OF INTERSTATE AND DEFENSE HIGHWAYS



Highway System

1969

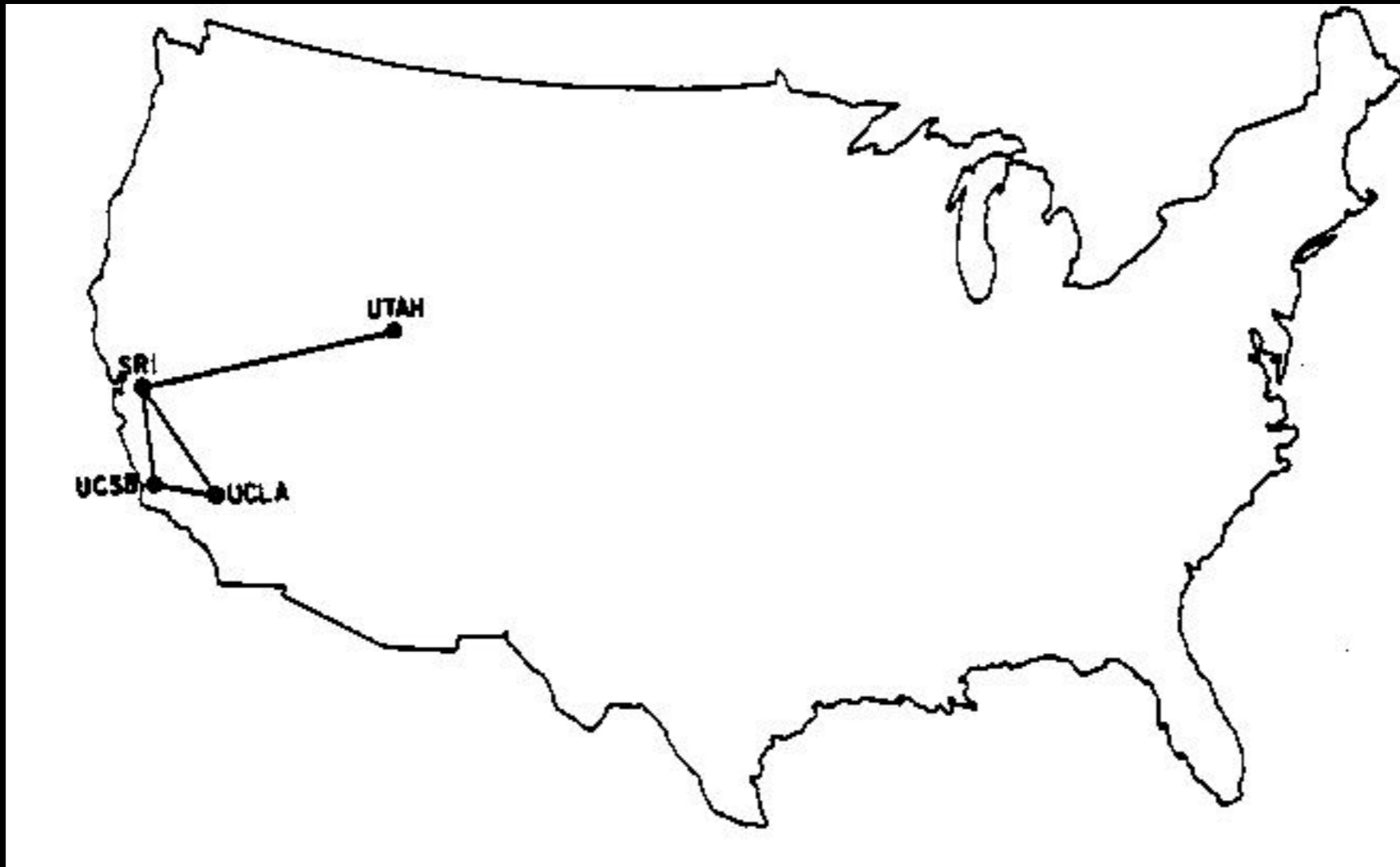


ARPANET

1969

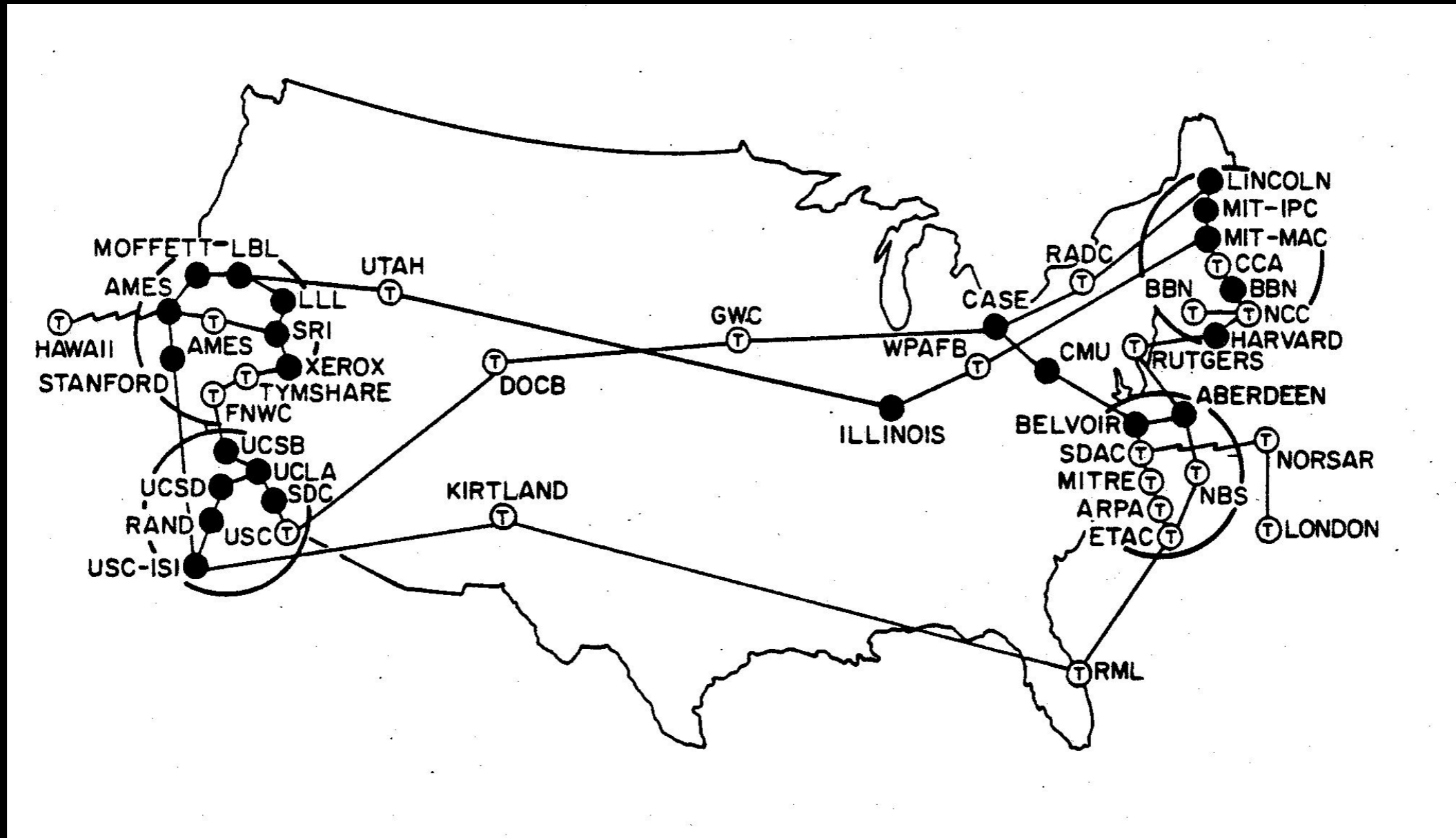
First host-to-host message from UCLA to the Stanford Research Institute

1969



ARPANET

1974



ARPANET

1970s

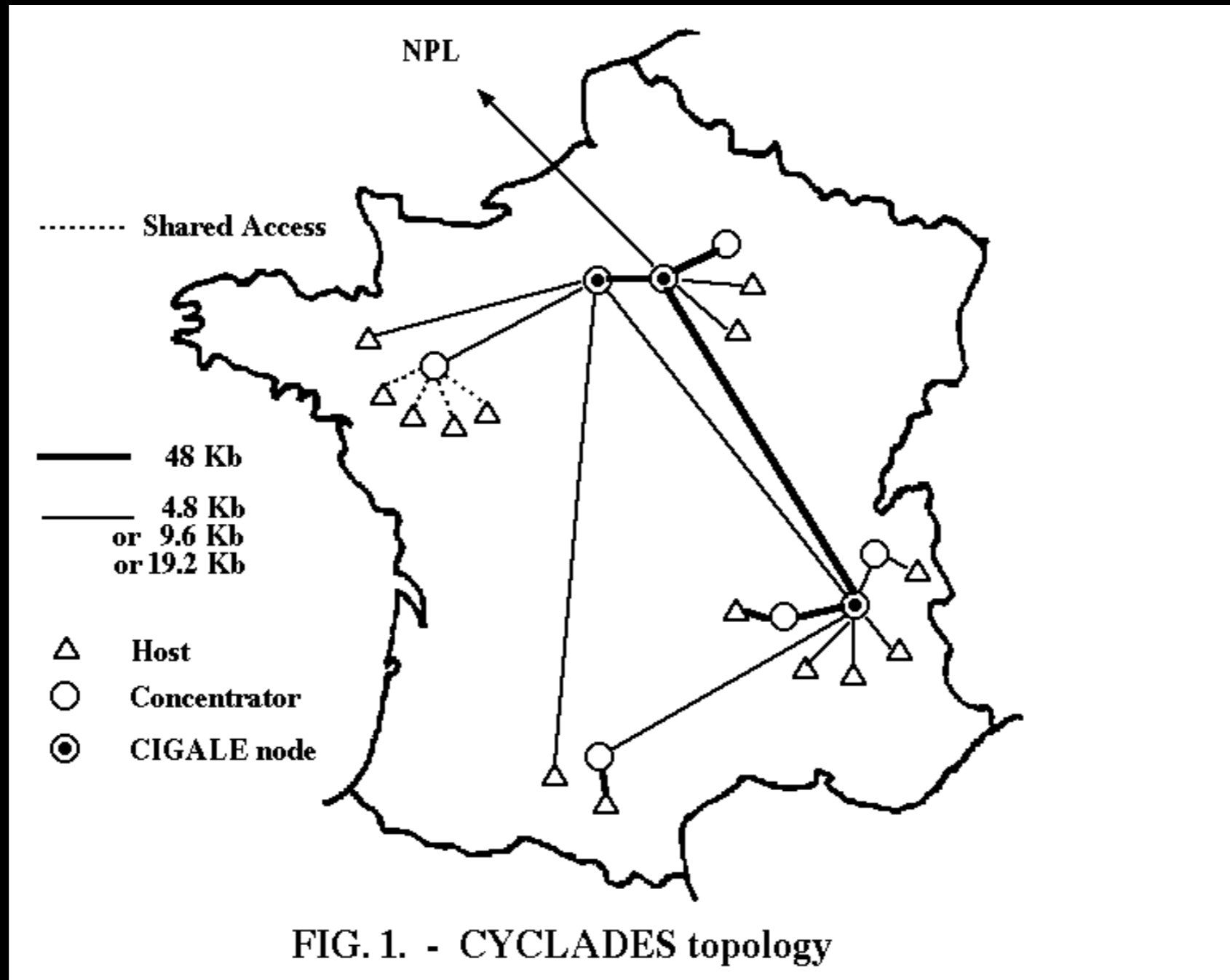


FIG. 1. - CYCLADES topology

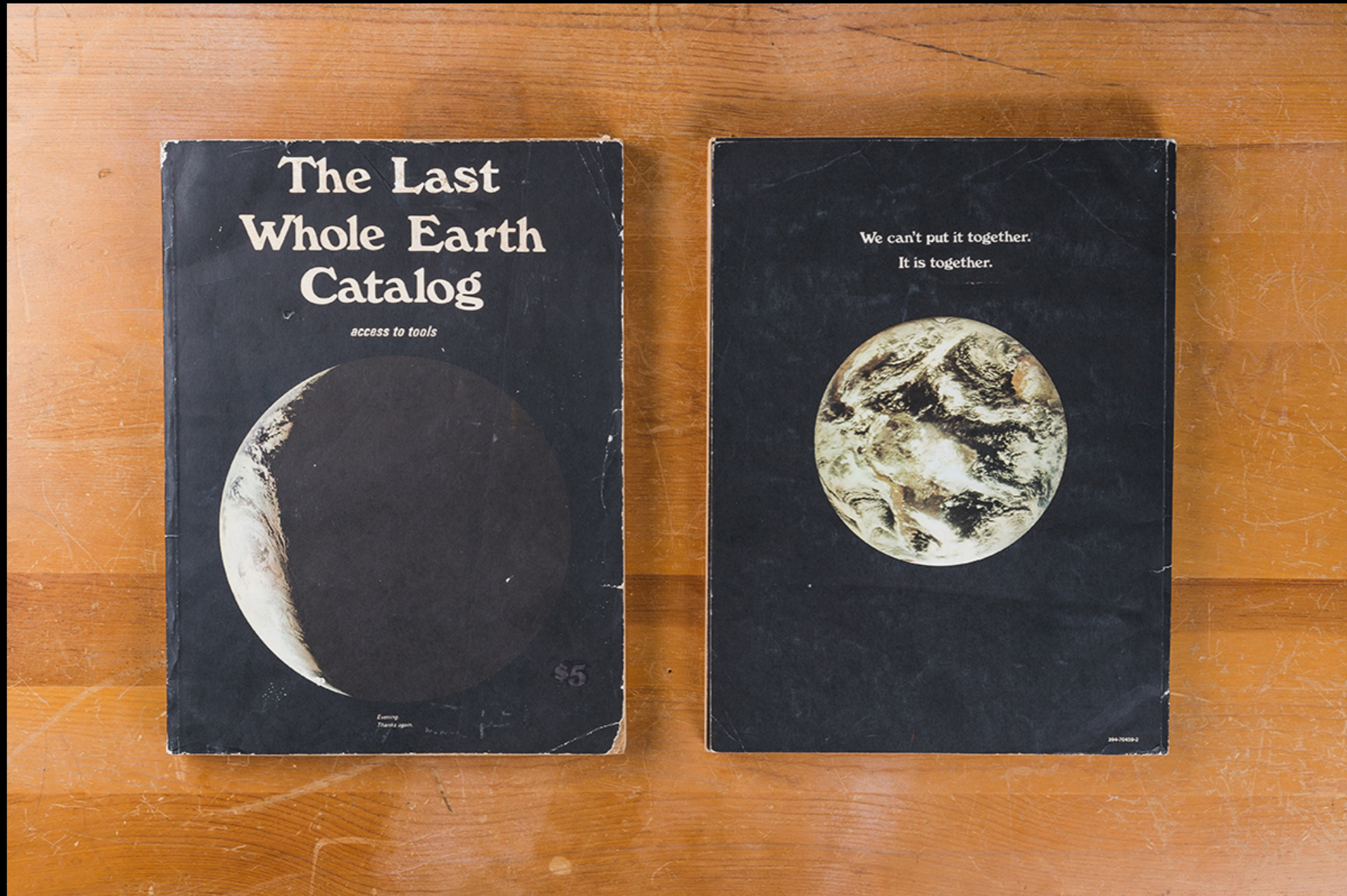
CYCLADES & Louis Pouzin

1968



Earthrise

1968



Stewart Brand's Whole Earth Catalog

1971

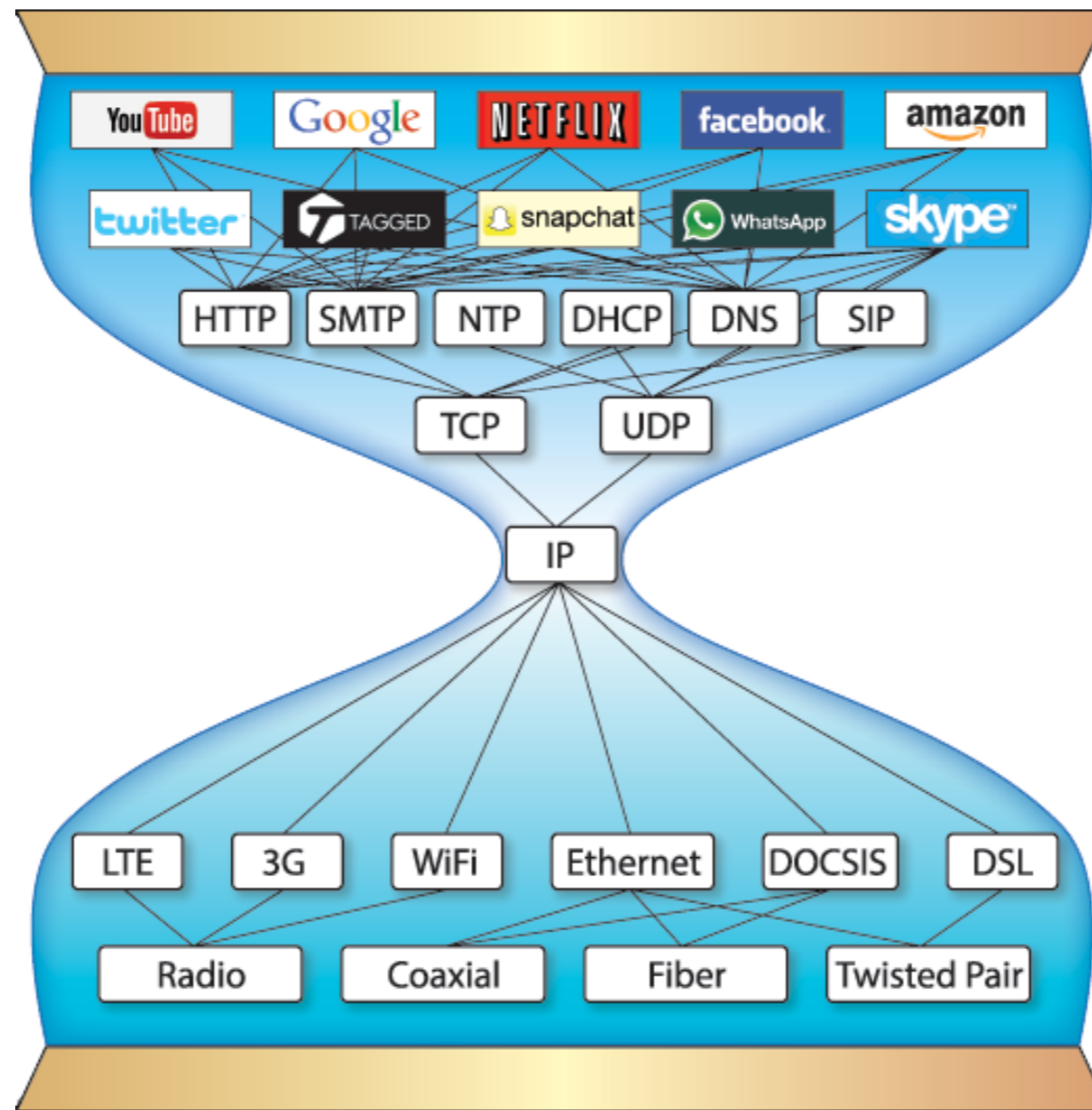


Email & Ray Tomlinson

1980

IP

Internet Protocol



Internet architecture (hourglass model)

1980s

TCP

Transmission Control Protocol

1990s

HTTP

Hypertext Transfer Protocol

1989

Vague but exciting ...

Tim Berners-Lee, CERN/DD

March 1989

World Wide Web & Tim Berners Lee

1991

WWW

World Wide Web & Tim Berners Lee

1991-

Physics 109 - Astronomy

Assignments


Date	Read Sec.	Date	Read Sec.
Aug. 31	1.1-1.3	Oct. 23	Hwk H
Sep. 2	2.1-2.3	Oct. 24	11.2
Sep. 4	Hwk A	Oct. 26	12.1, 12.2
Sep. 5	3.1-3.3	Oct. 28	13.1
Sep. 7	4.2-4	Oct. 30	Hwk J
Sep. 9	Gravity	Nov. 2	13.2
Sep. 11	Hwk B	Nov. 4	14.2
Sep. 12	5.1	Nov. 6	Hwk J
Sep. 14	5.2	Nov. 7	12.3
Sep. 16	5.3	Nov. 9	15.1, 15.2
Sep. 18	Hwk C	Nov. 9	15.4
Sep. 19	6.1	Nov. 11	14.1, 14.3
Sep. 21	Test 1	Nov. 13	Hwk K
Sep. 23	6.2-6.4	Nov. 14	Test 3
Sep. 25	Hwk D	Nov. 16	18.2, 16.1
Sep. 26	7.1 & 7.5	Nov. 18	16.3, 16.4

Handouts: Syllabus, Test 1 Info, Test 2 Info, Test 2 Pics, Test 3 Info, Test 4 Info, Lectures: Introduction, Gravity, Observations, Exoplanets, Sun, Exterior, Measuring Stars

ETH Zurich

Prof. Dr. Paul Embrechts

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ETH Zurich, HG F42.3
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• Secretary: Ms. Gaili Shikama
• Phone: +41-44-632 3400

[Curriculum Vitae]
[Short CV]
[Some Selected Papers]
[Building Bridges between Mathematics, Insurance and Finance] - An Interview with Paul Embrechts (Book)
[The Rearrangements Algorithm]
[Some Selected Talks]
[Prof. Dr. Paul Embrechts]
[Prof. Dr. Marko V. Whalen]
[My Postdoctoral Students]
[Research]
[Insurance, Mathematics and Stochastic Finance]
[ETH Risk Center]
[Swiss Finance Institute]

web.cse.ohio-state.edu/~panda.2

Dhabaleswar K. (DK) Panda

Welcome to my home page. I am a Professor and University Distinguished Scholar of Computer Science and Engineering at The Ohio State University. I lead the Network Based Computing Research Group.


My contact address is:

Dept. of Computer Science and Engineering Dresner Lab 785 The Ohio State University 2015 Neil Avenue Columbus, OH-43210, USA	Tel: (614) 292-5199 Fax: (614) 292-2911 Email: panda.1@osu.edu TKP@osu.edu
--	---

Prof. Panda has been recognized with a Rock Star of HPCA
MYAPICH User Group (MUG) Meeting 2017 was held in Columbus, Ohio

Multiple Positions available in my group:
1) Post-Doc/Research Scientist
2) MPI Software Engineer/Programmer

Welcome to My Home Page!



Biography
Publications

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Vinh University of Technology (VUTech)
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TEL: (84-4) 7549427 FAX: (84-4) 7547460
E-mail: nbinh@vut.edu.vn

Since 2000 to Feb. 2006:

Nguyen Ngoc BINH, Ph.D.
Assoc. Prof. at Dept. of Software Engineering, Faculty of IT
Director of Library and Information Network (Center) - LINC
Hanoi University of Technology
1 DaiCoViet St., Hanoi, Vietnam

Donald E. Knuth (葛德松), Professor Emeritus of The Art of Computer Programming at Stanford University, welcomes you to his home page.

Frequently Asked Questions
Infrequently Asked Questions
Recent News
Computer Musings
Known Errors in My Books
Help Wanted
Diamond Signs
Preprints of Recent Papers
Curriculum Vite

Ayodeji Demuren

Professor of Mechanical Engineering
(B.S., Ph.D., Imperial College, London)

Tel: (757) 683-6363
Fax: (757) 683-5344
Email: ademuren@odu.edu

Department of Mechanical Engineering
Old Dominion University
Norfolk, VA 23529

BACK TO THE MECHANICAL ENGINEERING

CONTENTS

- Awards
- Fields of Interest
- Current Research Projects
- Recent Publications
- Professional Affiliations

TU VIENNA

Ewa B. Weinmüller

Numerics and Simulation of Differential Equations

Welcome to my homepage

Ao. Univ. Prof. Dr. Ewa B. Weinmüller

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Vienna University of Technology
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Email: e.weinmueller@tuwien.ac.at

Photo: Werner Jäger, Wien 2006

Harry Buhman

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1090 GB Amsterdam
The Netherlands


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Telephone: 020-5924199 (+31 20 5924199)
Fax: 020-5924199
E-mail: Harry.Buhman@fuw.nl

Research Interests

Computational Complexity Theory

- Buhman H., Fortnow and L. Torralba, "Using Automata to Separate Complexity Classes" (FOCS'95)
- Buhman H., E. Hemmingway and L. Lingas, "PARALLEL REDUCTIONS TO TALLY" (STRUCTURES'91 to appear in SIAM J. on Comp.)
- Buhman H. and S. Homer, "Space-Bounded Circuit Lower Bounds and the Exponential Hierarchy" (PRL'93)
- Buhman H. and M. Hermon, "On the Sparse Set Complexity for Sets with Low Density" (STACS'95)
- Buhman H., A. Høyer and L. Torralba, "Splittable Reductions and Structure of Complete Sets" (STACS'95)
- Buhman H., J. Kallia and L. Torralba, "On Functions Computable with Nonadaptive Queries to NP" (STRUCTURES'94)
- Buhman H., E. Hemmingway, "An Extension to The Kolmogorov Random Set" (STRUCTURES'95)
- Buhman H. and P. Oppen, "Random Strings Make Hard Instances" (STRUCTURES'94, to appear in JCSS)
- Buhman H., B. Span and L. Torralba, "Bounded Reductions" (STACS'91, In Complexity Theory, 1991 (Cambridge University Press pp33-39))
- Buhman H., E. Span and L. Torralba, "The relative power of space and polynomial time reductions" (Comp. Comp., 1992, Vol. 3, No. 3 pp211-246)
- Buhman H. and L. Torralba, "On the Cutting Edge of Relativization: The Resource Bounded Injury Method" (ICALP'94)
- Buhman H. and L. Torralba, "P-selective Self-reducible sets: A New Characterization of P" (STRUCTURES, to appear in JCSS)
- Buhman H. and L. Torralba, "On the structure of complete sets" (STRUCTURES'95)
- Buhman H. and L. Torralba, "On the structure of complete sets" (STRUCTURES'95)
- Buhman H., L. Torralba and B. Span, "On the structure of complete sets" (STRUCTURES, 1993, Vol. 4, No. 4 pp271-294)

Welcome to my Website



Bernard Grofman
Jack W. Pelton Endowed Chair
Professor of Political Science and
Adjunct Professor of Economics
Former Director, Center for the Study of Democracy
University of California, Irvine
Department of Political Science
3151 Social Science Plaza
Irvine CA 92697-5100
hgrofman@uci.edu

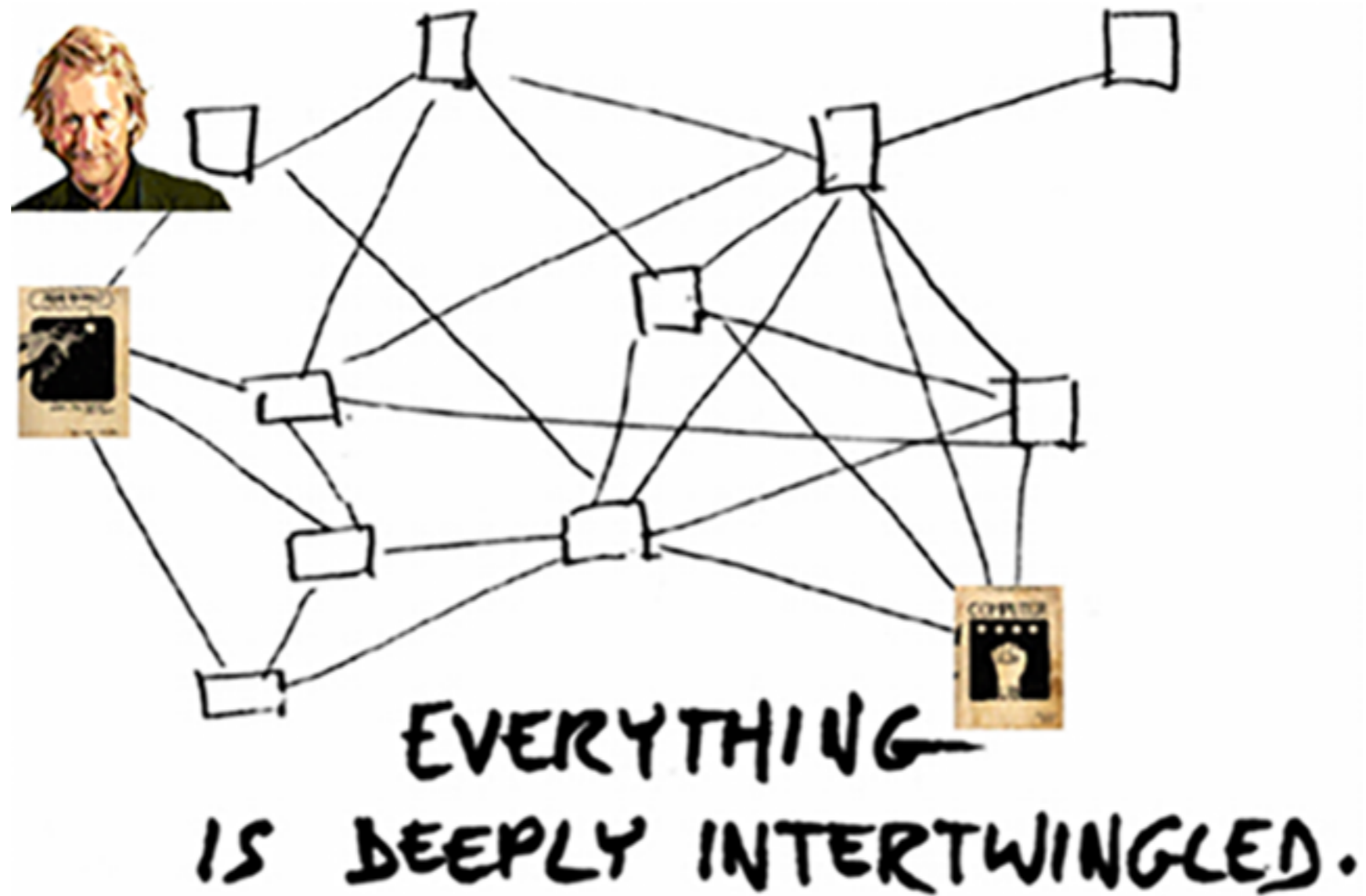
Professor Grofman received his B.S. in Mathematics at the University of Chicago in 1966 and his Ph.D. in Political Science at the University of Chicago in 1972. He has been teaching at the University of California, Irvine since 1976 and a Full Professor since 1980, and the Jack W. Pelton Endowed Chair since 2008. He has been a Fellow at the Center for Advanced Study in the Behavioral Sciences, Stanford, visiting professor at the University of Michigan and at the University of Washington, and guest scholar at the Brookings Institution, and at New York University Law School. He has also been a visiting scholar at the University of Mannheim (Germany) at Kansai University, Osaka (Japan), at the University of Bologna (Italy), at the Berlin Science Center (Germany), at the Pompeu Fabra University, Barcelona (Spain), at the University of Paris, II (France) and at Nuffield College, Oxford University (England), and a short term scholar-in-residence at the University of Tilburg (Netherlands) and the University of Victoria (Canada), the University of Caen (France), the University of Konstanz (Germany), the Institute for Advanced Study (Vienna, Austria), and the Central European University (Budapest, Hungary). In 2017 he will be a short term scholar-in-residence at the University of Lüneburg (Germany) and the Juan March Institute, Juan Carlos III University (Madrid, Spain). He received an Honorary Doctorate in Political Science from the University of Copenhagen (Denmark) in 2010. For the academic year 2012-13 he was a Research Fellow at the Sirius Institute for the Advanced Study of Law and Justice at New York University Law School.

Websites of professors
 "Prof. Dr. Style" by Olia Lialina
<http://contemporary-home-computing.org/prof-dr-style/>

1960

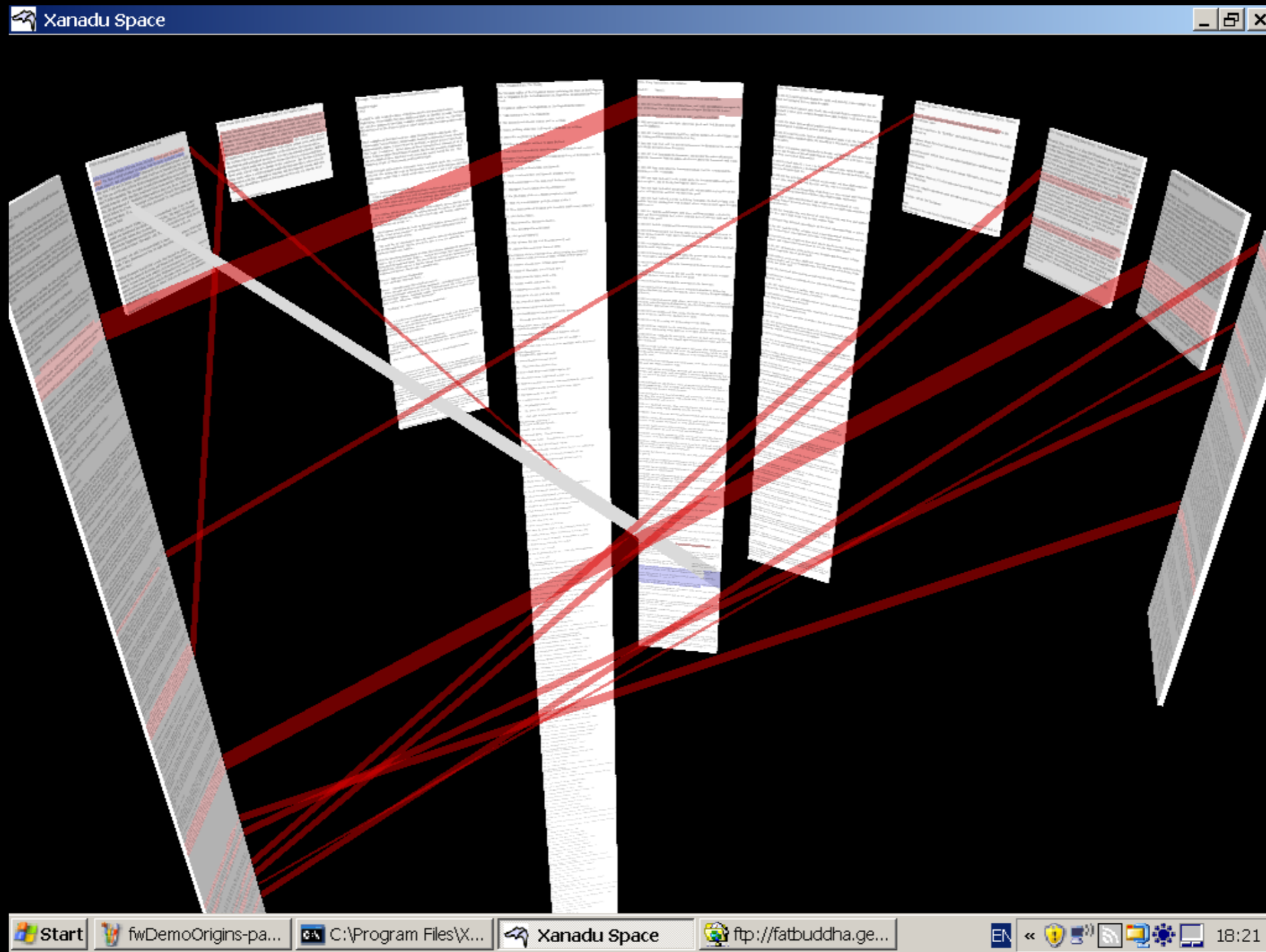
Ted Nelson's Project Xanadu

1974



Computer Lib / Dream Machines

1997



XanaduSpace

pyxii v2.16

1.1.0.1.0.3	Document Edit Link back fwd reload	compare	1.1.0.1.0.3.1	Document Edit Link back fwd reload
<p>A Declaration of the Representatives of the United States of America, in General Congress assembled</p>			<p>The Unanimous Declaration of the Thirteen United States of America</p>	
<p>When in the course of human events, it becomes necessary for a people to advance from that subordination in which they have hitherto remained, and to assume among the powers of the Earth, the equal and independent station to which the laws of nature and of nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the change.</p>			<p>When in the course of human events, it becomes necessary for one people to dissolve the political bands which have connected them with another, and to assume among the powers of the Earth, the separate and equal station to which the laws of nature and of nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation.</p>	
<p>We hold these truths to be sacred and undeniable, that all men are created equal and independent, that from that equal creation they derive rights inherent and inalienable, among which are the preservation of life, and liberty, and the pursuit of happiness; that to secure these ends, governments are instituted among men, deriving their just powers from the consent of the governed; that whenever any form of government shall become destructive of these ends, it is the right of the people to alter or to abolish it, and to institute new government, laying its foundation on such principles and organising its powers in such form, as to them shall seem most likely to effect their safety and happiness. Prudence, indeed, will dictate that governments long established should not be changed for light and transient causes; and accordingly all experience hath shewn that mankind are more disposed to suffer while evils are sufferable, than to right themselves by abolishing the forms to which they are accustomed. But when a long train of abuses and usurpations, begun at a distinguished period, and pursuing invariably the same object, evinces a design to subject them to arbitrary power, it is their right, it is their duty, to throw off such government and to provide new guards for their future security. Such has been the patient sufferance of these colonies; and such is now the necessity which constrains them to expunge their former systems of government. The history of his present majesty, is a history of unremitting injuries and usurpations, among which no one fact stands single or solitary to contradict the uniform tenor of the rest, all of which have in direct object the establishment of an absolute tyranny over these states. To prove this, let facts be submitted to a candid world, for the truth of which we pledge a faith yet unsullied by falsehood.</p>			<p>We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable rights, that among these are life, liberty, and the pursuit of happiness; that to secure these rights, governments are instituted among men, deriving their just powers from the consent of the governed; that whenever any form of government shall become destructive of these ends, it is the right of the people to alter or to abolish it, and to institute new government, laying its foundation on such principles and organising its powers in such form, as to them shall seem most likely to effect their safety and happiness. Prudence, indeed, will dictate that governments long established should not be changed for light and transient causes; and accordingly all experience hath shewn that mankind are more disposed to suffer while evils are sufferable, than to right themselves by abolishing the forms to which they are accustomed. But when a long train of abuses and usurpations, pursuing invariably the same object, evinces a design to reduce them under absolute despotism, it is their right, it is their duty, to throw off such government and to provide new guards for their future security. Such has been the patient sufferance of these colonies; and such is now the necessity which constrains them to expunge their former systems of government. The history of the present King of Great Britain is a history of repeated injuries and usurpations, all of which have in direct object the establishment of an absolute tyranny over these states. To prove this, let facts be submitted to a candid world.</p>	
<p>He has refused his assent to laws the most wholesome and necessary for the public good.</p>			<p>He has refused his assent to laws the most wholesome and necessary for the public good.</p>	
<p>He has refused his assent to laws the most wholesome and necessary for the public good.</p>			<p>He has forbidden his governors to pass laws of immediate</p>	

1996



Internet Archive
<http://archive.org>

2009



Internet Archive
<http://archive.org>

Internet Archive
<http://archive.org>

1990s



America Online (AOL)

1994-2009

YAHOO! GEOCITIES

SERVICE
ANNOUNCEMENT

Final notice: GeoCities is closing.

Dear Yahoo! GeoCities customer,

We're writing to remind you that Yahoo! GeoCities, our free web site building service and community, is closing on **October 26, 2009**.

On October 26, 2009, your GeoCities site will no longer appear on the Web, and you will no longer be able to access your GeoCities account and files.

What You Need to Do

If you'd like to move your web site, or save the images and other files you've posted online, you need to act now by choosing one of the following options:

Yahoo! GeoCities

2011-



One Terabyte of Kilobyte Age: Digging through the Geocities Torrent
Olia Lialina & Dragan Espenschied
<http://blog.geocities.institute>

Attention Shoppers: Internet Is Open

By PETER H. LEWIS

Published: August 12, 1994

At noon yesterday, Phil Brandenberger of Philadelphia went shopping for a compact audio disk, paid for it with his credit card and made history.

2000s-2010s



**BUT IT'S ONLY *SOME*
OF THE WEB, RIGHT?**

Switching from the Page to the Feed
via Anil Dash, "The Web We Lost," 2013

2001



WIKIPEDIA
The Free Encyclopedia

Wikipedia

2000s, 2010s-



“Imagine a world without free knowledge”

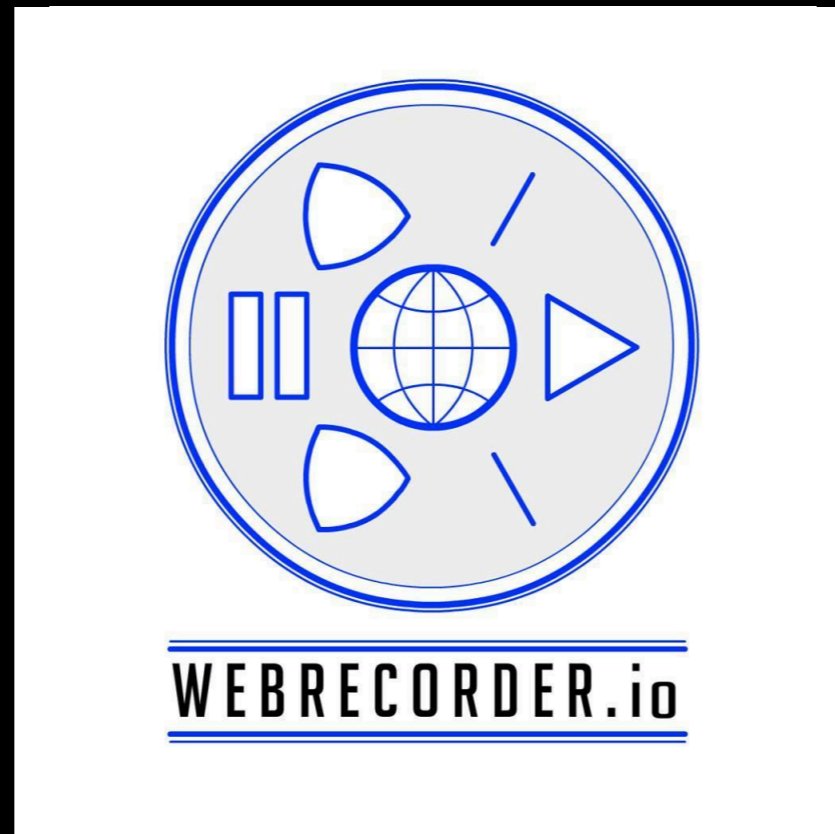
Net Neutrality, SOPA, PIPA

2007



iPhone

2015



Rhizome's Webrecorder

2016

The screenshot shows a web browser window with the following elements:

- Browser Tab:** "Thanks Obama"
- Address Bar:** `archive.rhizome.org/narrative-archives/thxobama.html`
- Page Header:** "Webrecorder / despens / WHO" and "Sign Up Login"
- Page Title:** "Thanks Obama"
- Text Content:**
 - "In late 2009, the conservative blog *Authentic Connecticut Republican* published an image in the style of a de-motivational poster sarcastically stating [1](#) Thanks Obama."
 - "In 2013, the *International Business Times* published the opinion piece [2](#) Smaller US Paychecks In 2013 Spark Twitter Outrage From Disgruntled Obama Voters, linking to the apparent evidence on Twitter."
 - "The referenced tweets by themselves didn't have much impact. Posted by users with [3](#) very low follower counts, the tweets lacked hashtags and mostly received [4](#) zero likes or [5](#) retweets. Conservative sites like [6](#) twitchy were key in focusing the attention."
 - "Since many of the original tweets expressed disappointment about a few dollars less on a paycheck, more meme-savvy users started to associate them with [7](#) white people problems, as exemplified by infomercials which picture the slightest discomfort (typically caused by an abundance of possessions and free time) as grave issues. This sparked a wave of parody GIFs being made, combining the
- Share Buttons:** Tweet, Share, Pin, VM, Embed
- Vine Player:**
 - Replaying 2.07 GB 566 bookmarks Autoscroll
 - Current URL: `https://vine.co/v/OPq02dpidBM`
 - Date: from 11/29/2016, 10:12:50 AM
 - Video: Barack Obama in a library setting, holding a cookie over a glass of milk.
 - User: Samir Mezrahi (Feb 12, 2015)
 - Caption: Thanks Obama
 - Engagement: 59,022,217 Loops, 475.5K Likes, 270.9K Revines, 17.2K Comments
 - Input: "Say something nice"
- Footer:** Blog Help Jobs Contact Terms Privacy Rules © 2016 Vine Labs, Inc.

Rhizome's Webrecorder

2010s-

The Internet of Things

Key Terms

A host is a computer on the network that can communicate with other computers. Think of it as a single node in the network diagrams.

When a host sends information, it's called a *server*.
When a host receives information, it's called a *client*.

Protocol is a way in which information is passed from one computer to another. It's like a language that all hosts (computers on the network) speak. Many protocols that make up the internet as we know it:

HTTP – hypertext transfer protocol

FTP – file transfer protocol

IP – internet protocol

TCP – transmission control protocol

DNS stands for “Domain Name Service.” Every website is actually a number (its IP), but DNS lets us refer to these numbers with language.

Example:

allmyfriendsatonce.com = 198.74.60.197

Most websites have:

1. Server (a computer always connected to the Internet that sends information when you request it)

Such as dreamhost.com, mediatemple.com, godaddy.com, etc. These are called “hosting providers.” From a host, you’ll receive your own unique IP (string of numbers).

2. Domain (a special name for the server)

Domains are simply special words that the host points to, like veryinteractive.net. You can buy domains at “domain name registrars” such as name.com, iwantmyname.com, namecheap.com, etc.

X.

THE FUTURE

