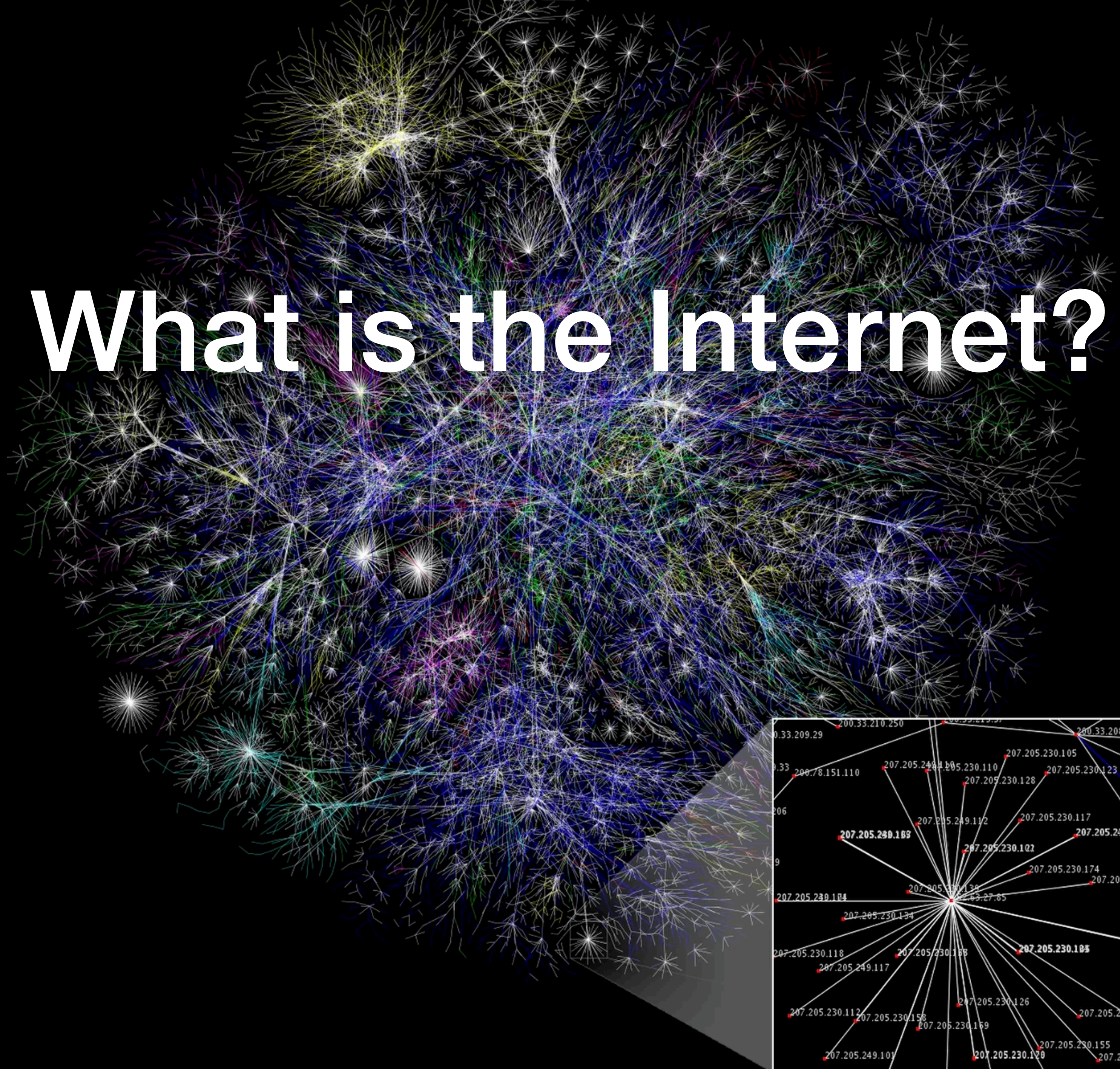


# A Brief History: The Internet, Technology and Design

**Domenic J. Licata, Instructional Support Technician**  
**University at Buffalo Department of Art**  
**[djlicata@buffalo.edu](mailto:djlicata@buffalo.edu)**



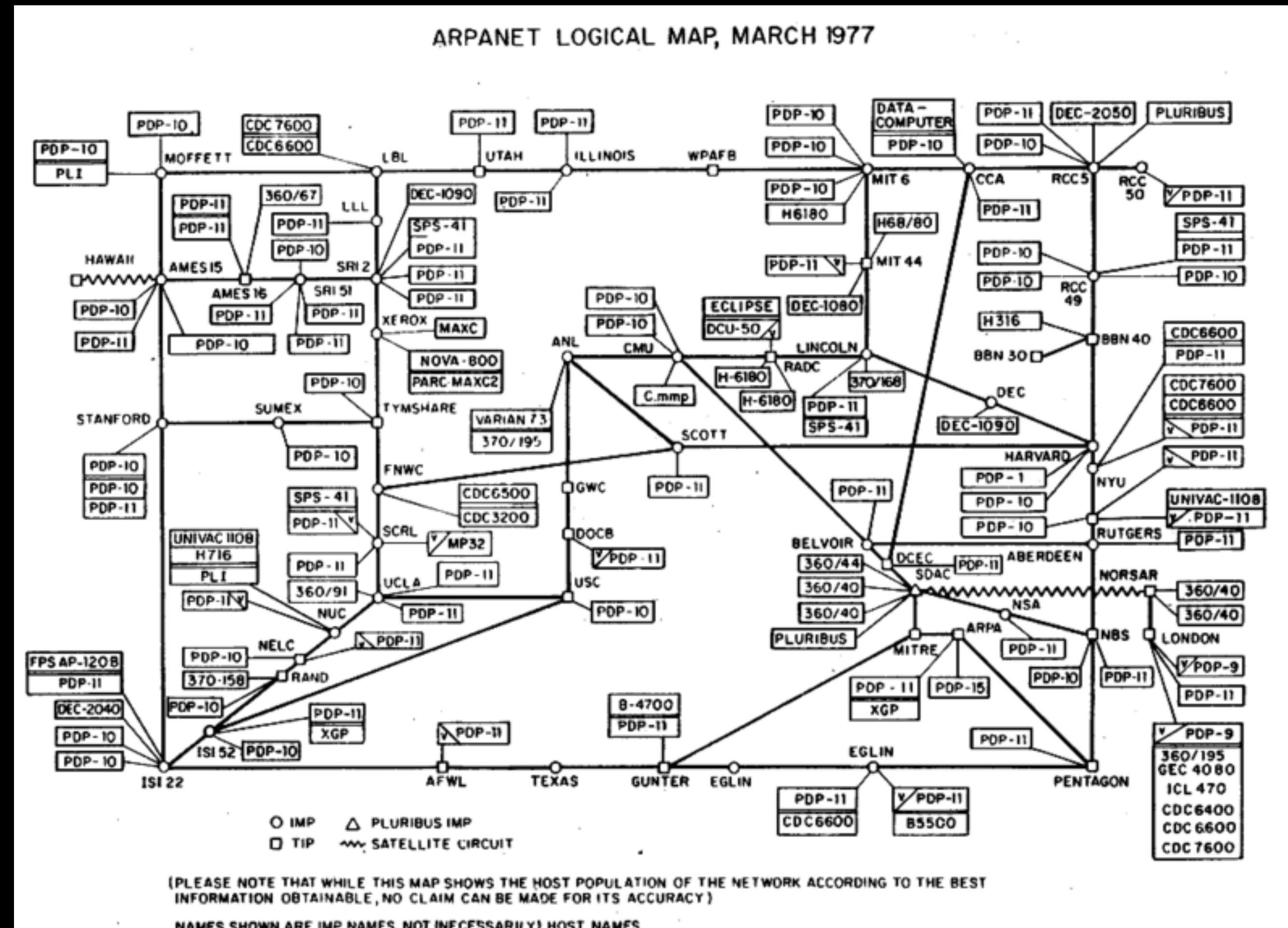
# What is the Internet?



Watch this:

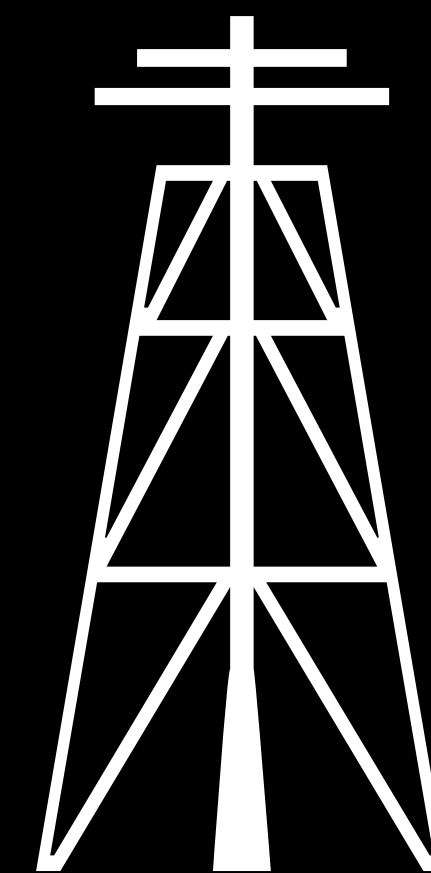
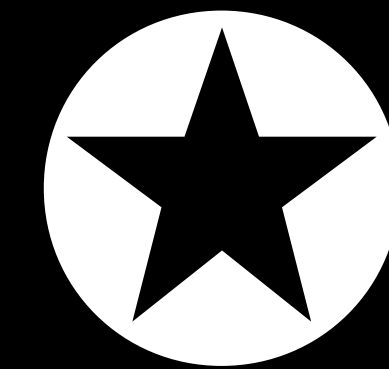
**DON'T FEAR *the* INTERNET**

# 1969: Arpanet

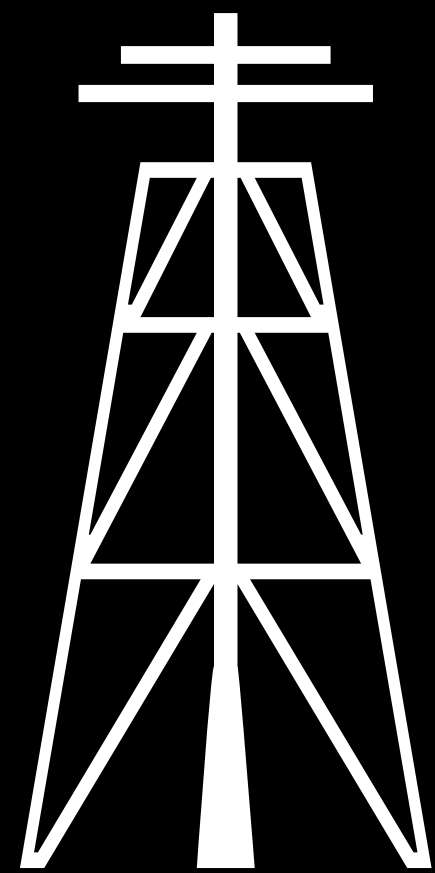
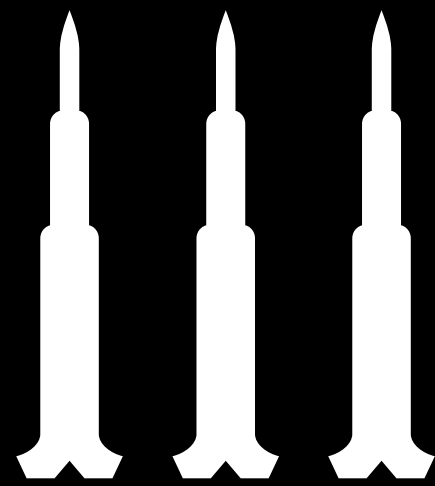


On the October 29, 1969, computers at Stanford and UCLA connected for the first time

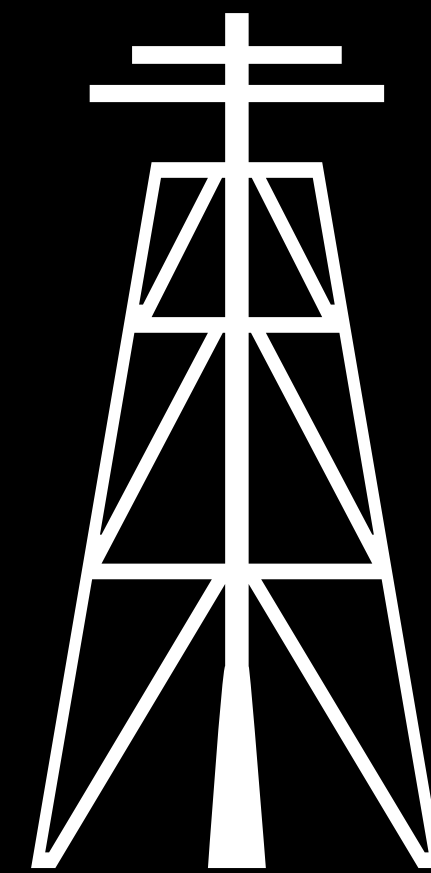
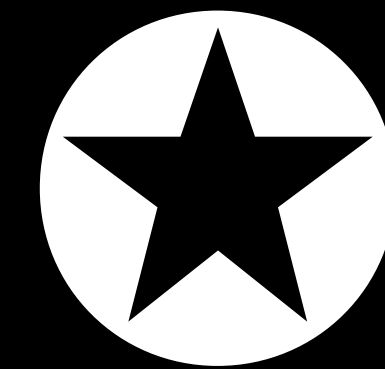




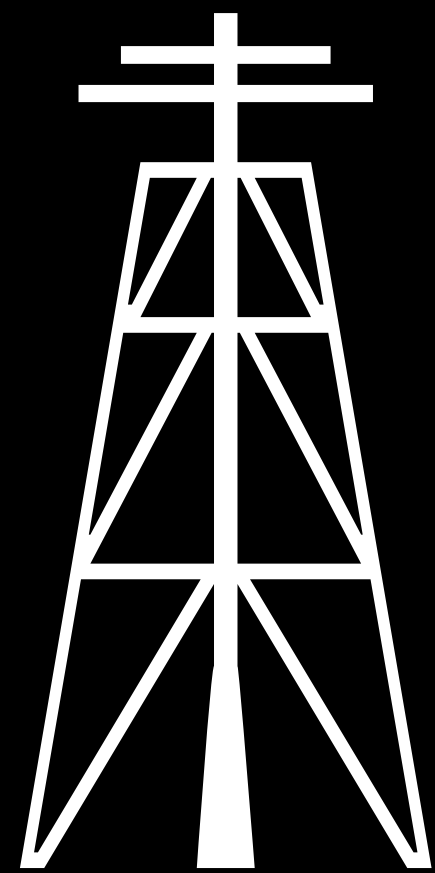
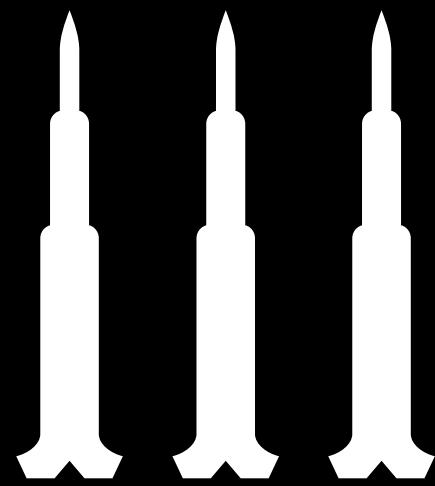
DC



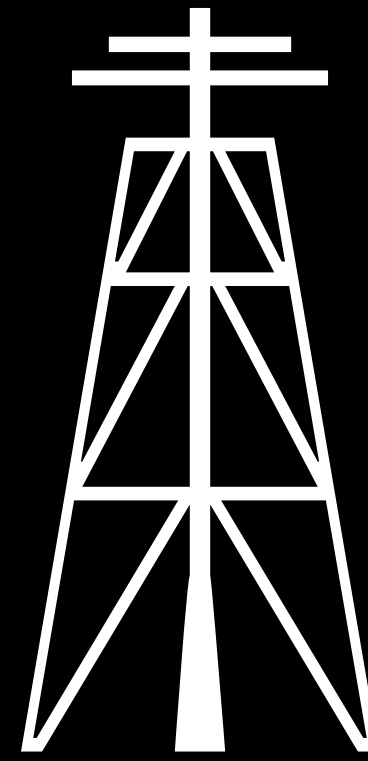
NV



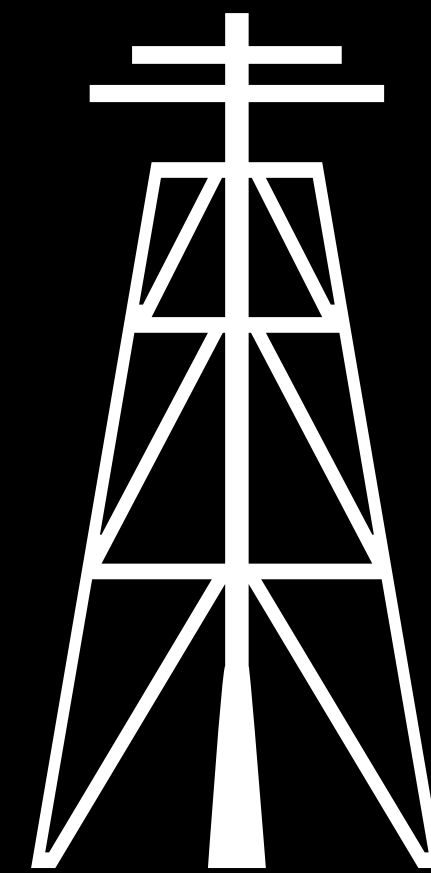
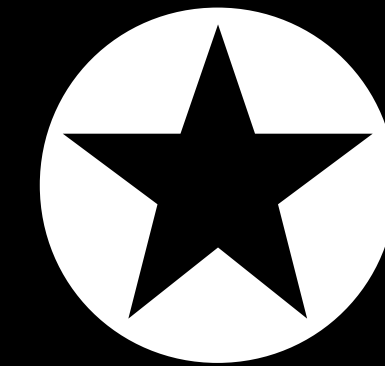
DC



NV

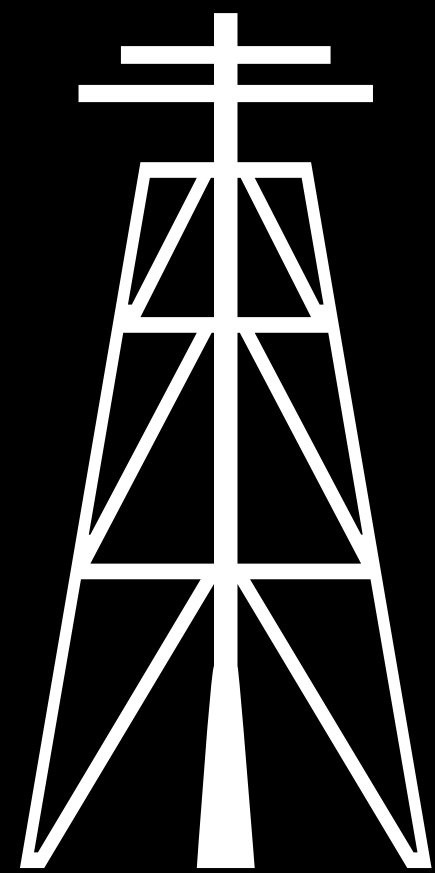
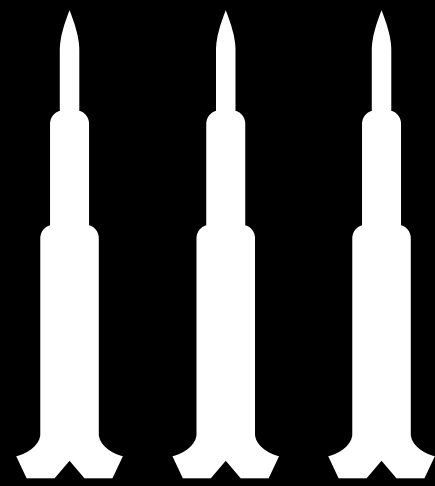


CHI

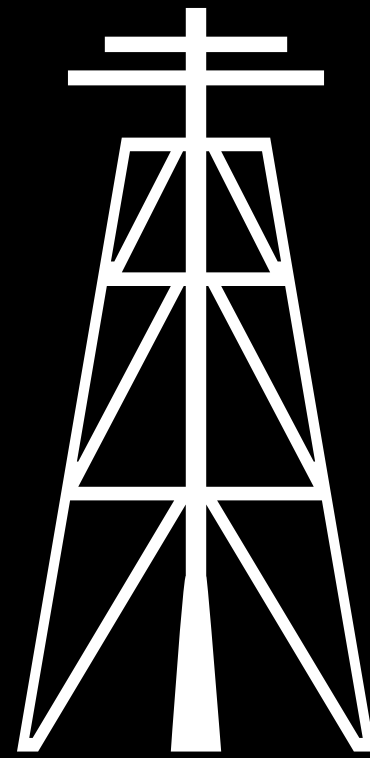


DC

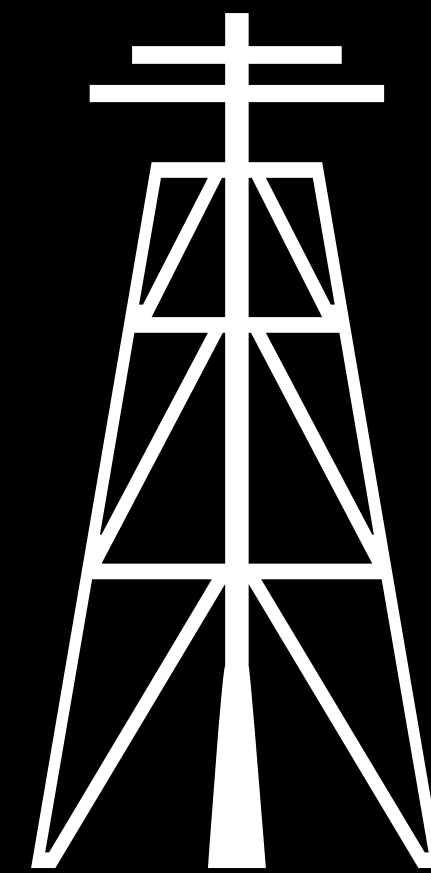
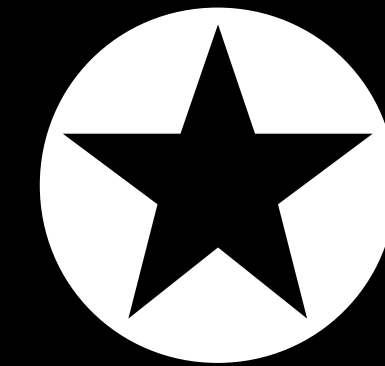




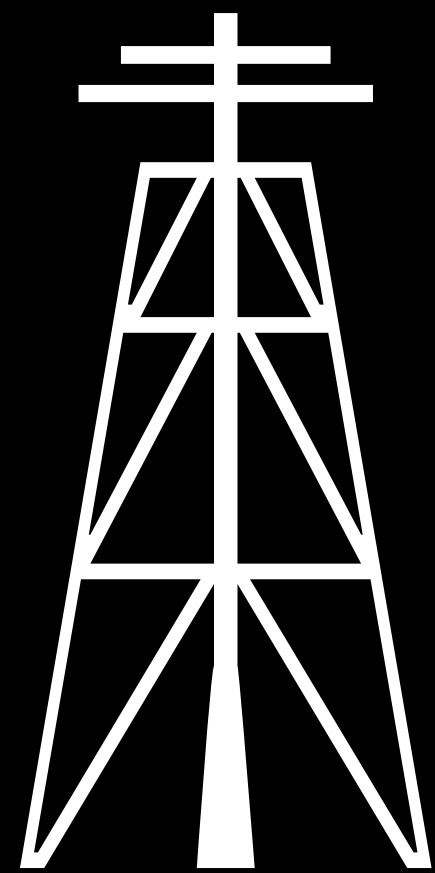
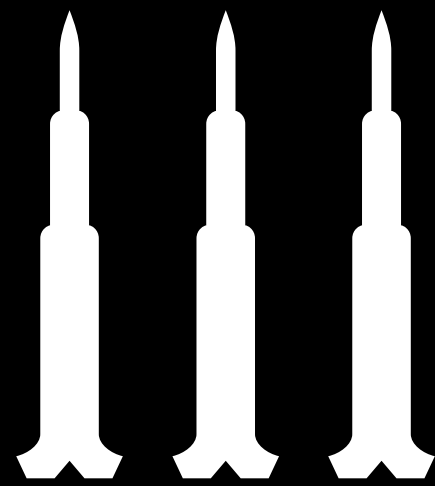
NV



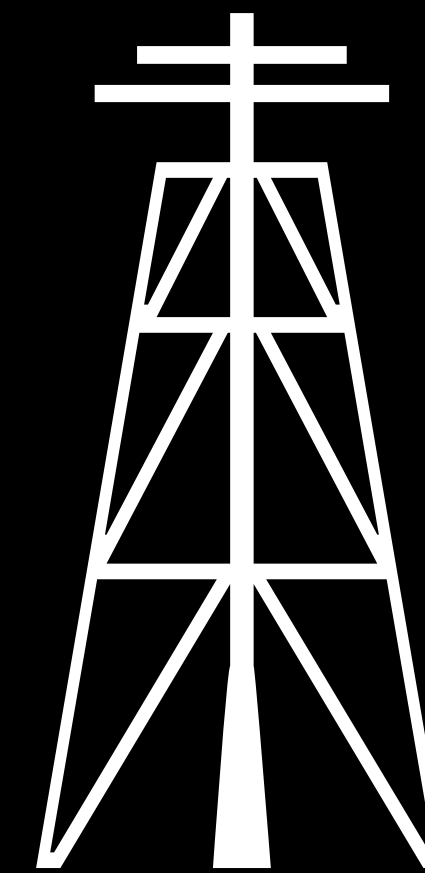
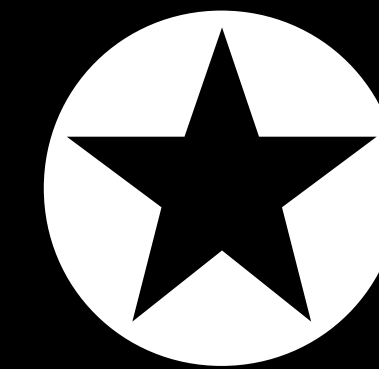
CHI



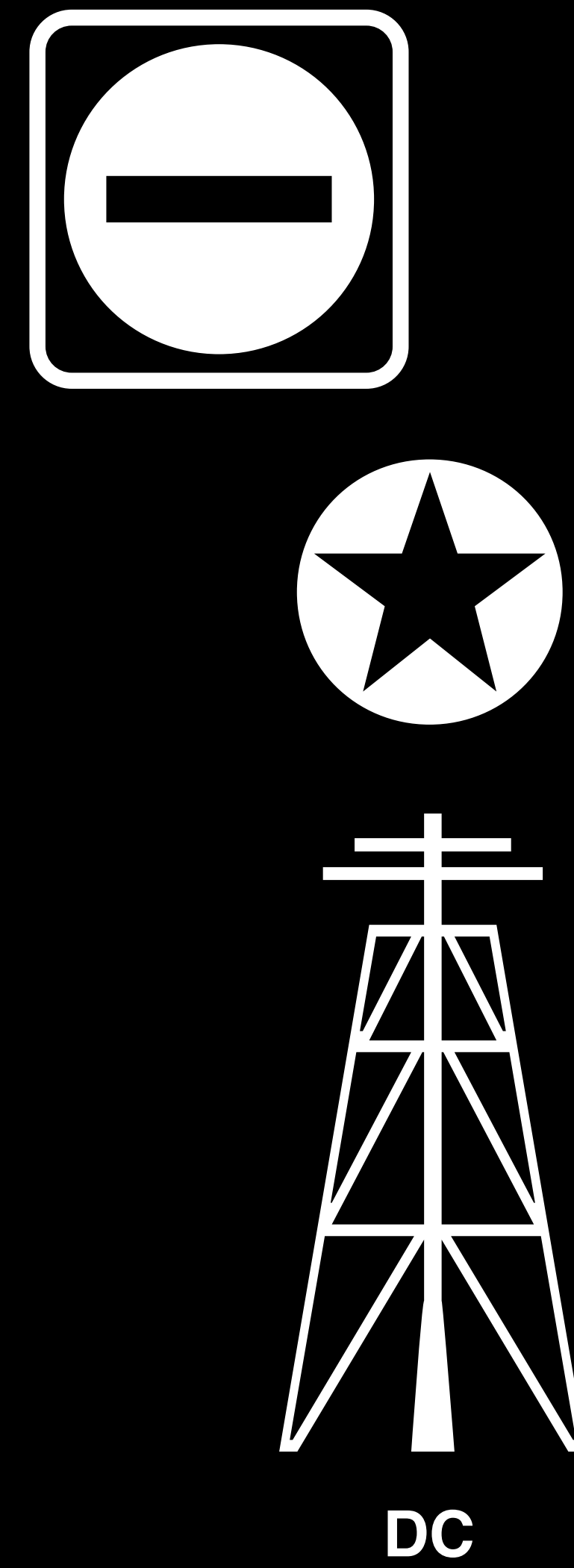
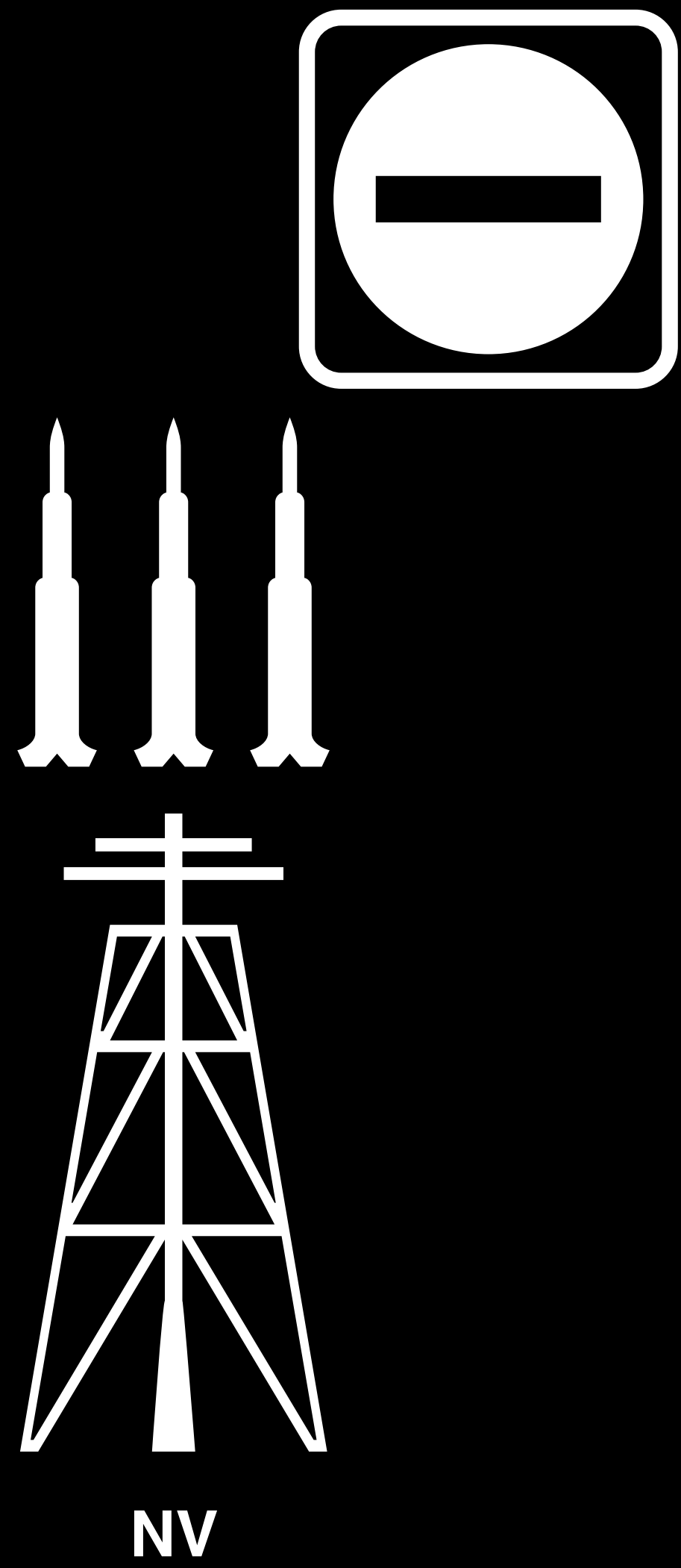
DC



NV



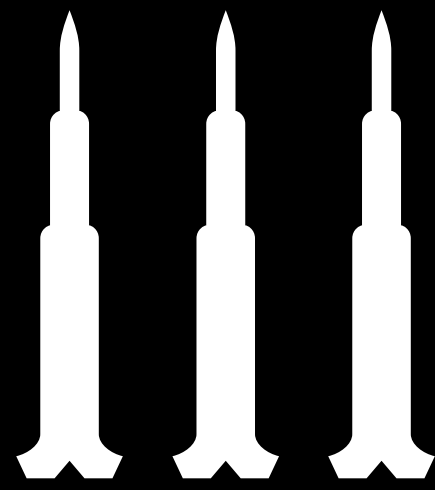
DC



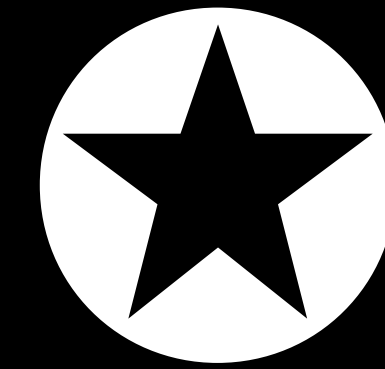




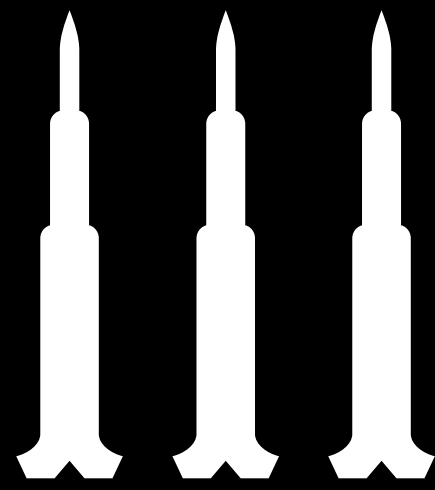
DC



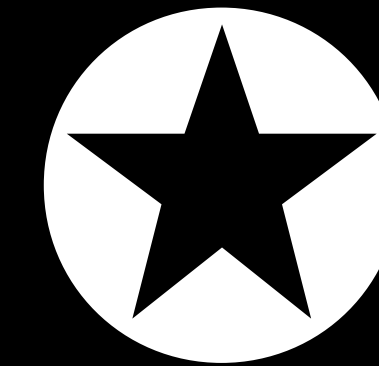
NV



DC



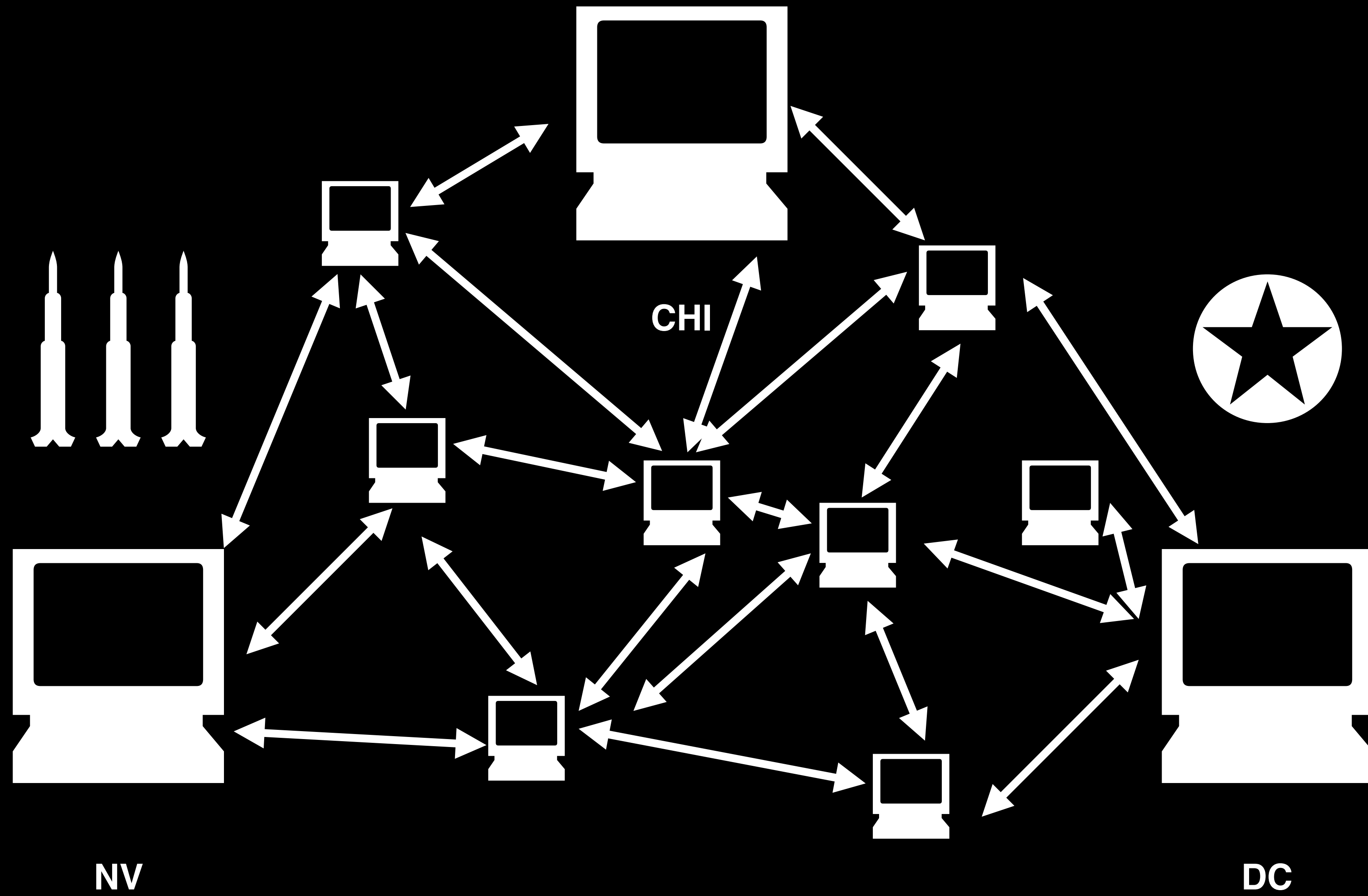
CHI



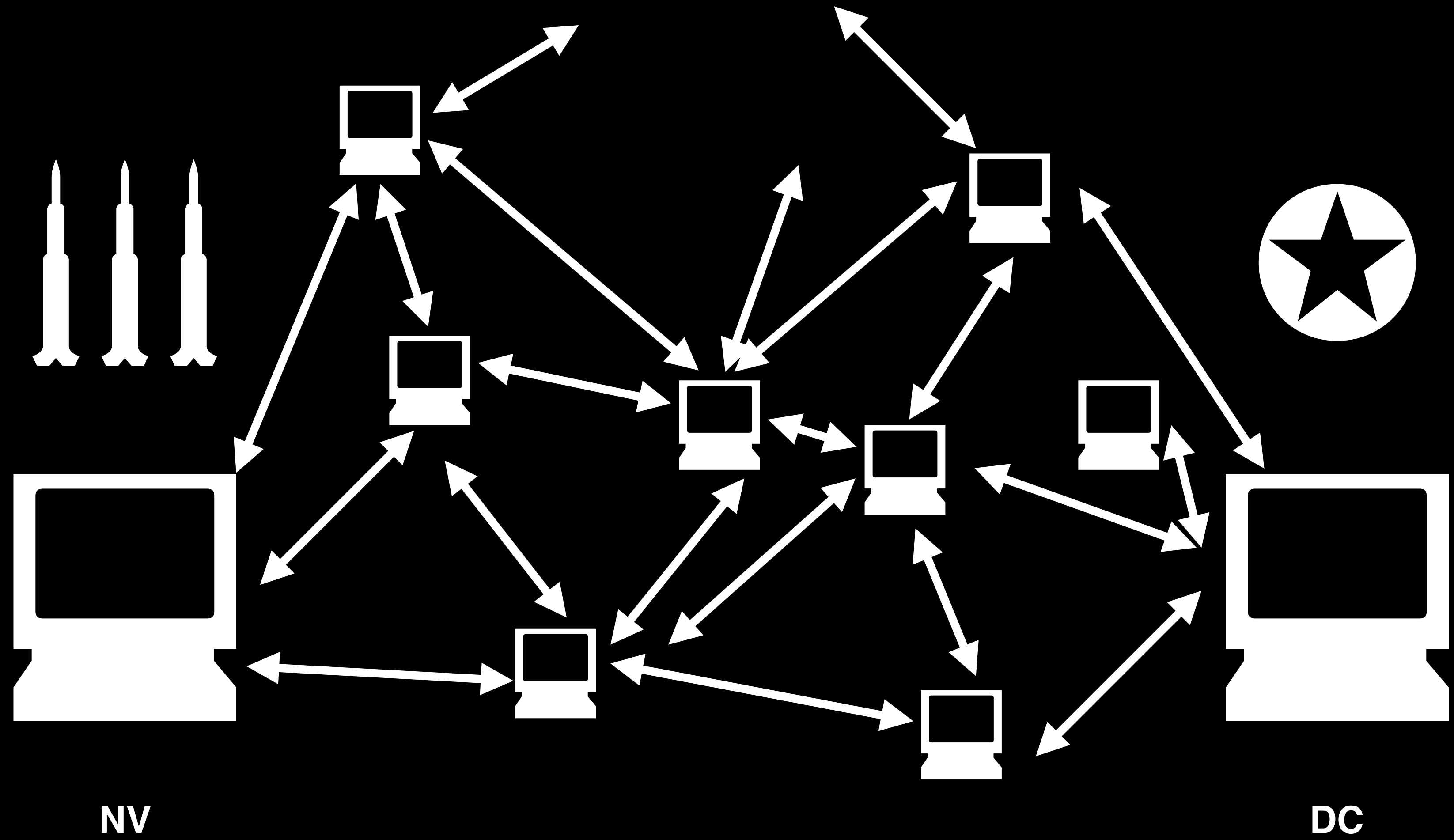
NV



DC







# 1969: Unix

```
MAN(1)                               NetBSD General Commands Manual          MAN(1)
NAME
  man - display the on-line manual pages (aka ``man pages``)
SYNOPSIS
  man [-acw|-h] [-C file] [-M path] [-m path] [-S srch] [[-s] section] name
  man [-k] [-C file] [-M path] [-m path] keyword ...
DESCRIPTION
  The man utility displays the BSD man pages entitled name.

  The options are as follows:

  -a      Display all of the man pages for a specified section and name
          combination.  (Normally, only the first man page found is dis-
          played.)

  -C      Use the specified file instead of the default configuration file.
          This permits users to configure their own man environment.  See
          man.conf(5) for a description of the contents of this file.

/usr/share/man//cat1/man 0 20%
```

Telnet , 1969. Terminal command line control

# 1971: Email



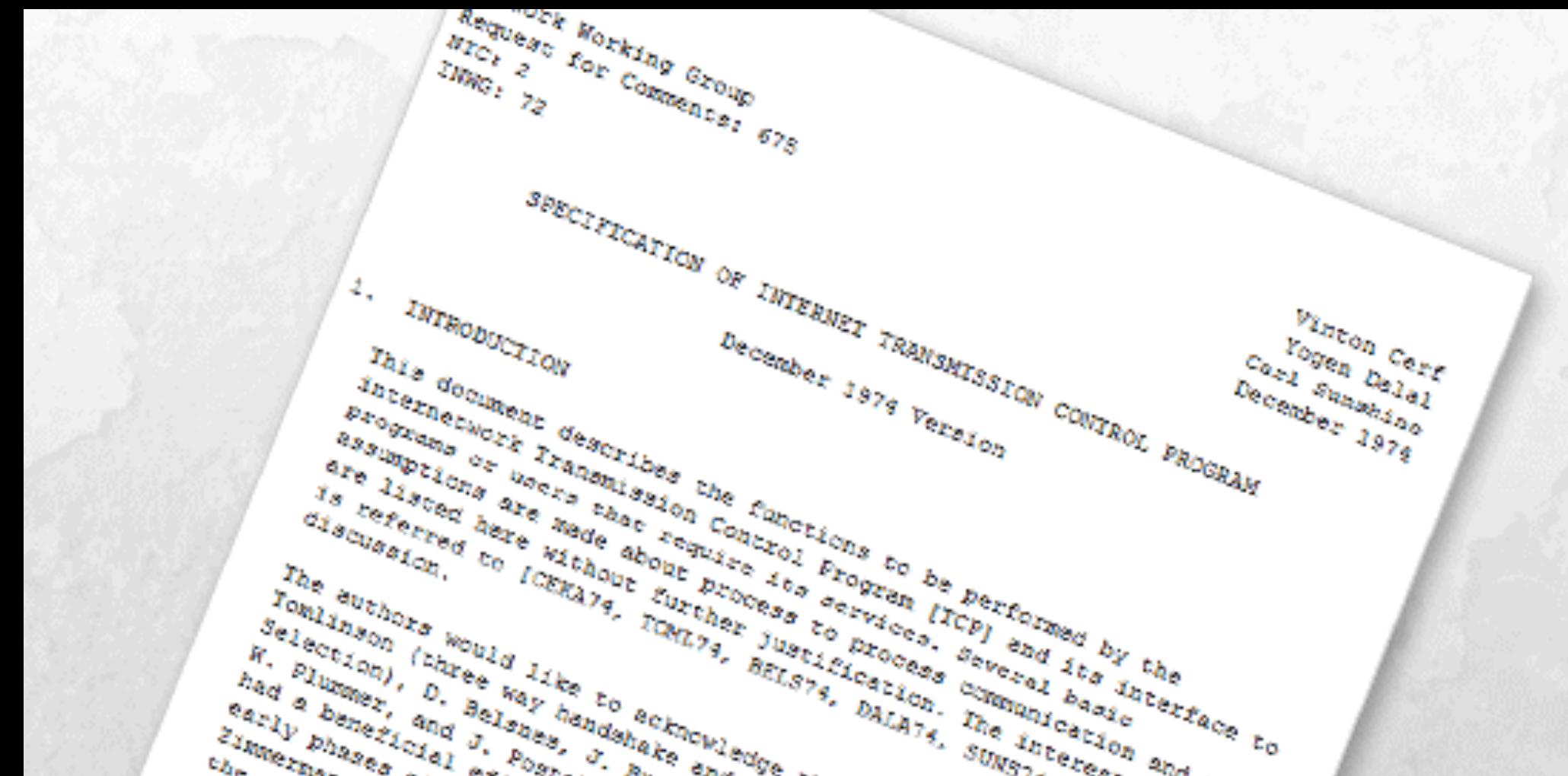
Ray Tomlinson, made the decision to use the "@" symbol to separate the user name from the computer name (which later on became the domain name)

# 1971: Project Gutenberg



Michael Hart realized that the future of computers wasn't in computing itself, but in the storage, retrieval and searching of information. Launched a global effort to make books and documents in the public domain freely available electronically in a variety of eBook and electronic formats

# 1974: TCP/IP



A protocol that link disparate Arpanet-Like networks together. Arpanet switched to TCP/IP in 1983

# 1977: PC Modems



Developed by Dennis Hayes and Dale Heatherington

# 1978: Bulletin Board System (BBS)

```

#####
# 06:22 am 06/01/16 Level 29
# 05/26/16 Node 1 Up 3 days 14:13
# FirstOn: 03/22/16 Calls 1450 of 1978
#####

** Read/Post Messages      ** Message Area Selection  ** Electronic Mail
+--+                      +--+                      +--+
| N| New message scan      | J| Jump to new msg area  | E| Read/Send E-mail
| R| Read message prompt  +--+ * List sub-boards    +--+
| Z| Continuous new scan  /* List groups          ** Other Commands
| B| Browse new scan      { } # Select sub-board  +--+
| Q| QWK packet transfer  [ ] /# Select group      | D| Default user config
| P| Post a message       ** Go to                      | &| Message scan config
| A| Post auto-message    +--+                      | U| User lists
+--+                      +--+                      | I| Information
** Message Search        | T| File Transfer section | M| Minute Bank
+--+                      | G| Text file section   | /L| Node activity
| F| Find text in messages| C| Chat section          | ^K| Ctrl-key Menu
| S| Scan for msgs to you | X| External programs     | O| Logoff BBS (or /O)
+--+                      +--+                      +--+
Anytime | Ctrl-U Who's online Ctrl-P Send private msg Ctrl-C Abort cmd/text
! = Sysop Menu

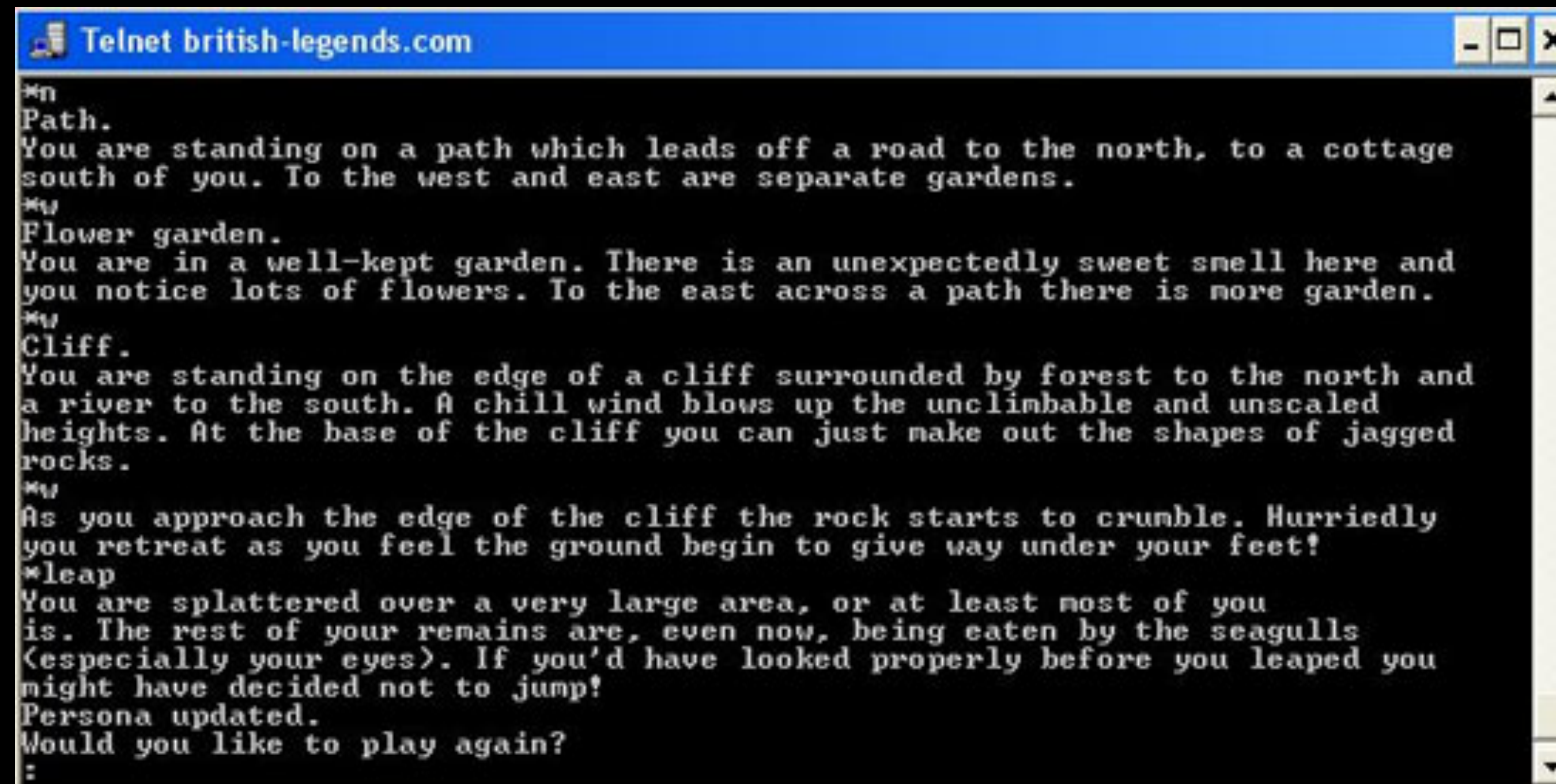
Main 3:59:36 [1] Local [4] Entertainment:

```

## MAIN MENU

<h3 style="text-align: center;">System Commands</h3> <ul style="list-style-type: none"> <li>·P· to Pause</li> <li>(SPACE) to abort</li> <li>CTRL-O On-Line Help</li> <li>CTRL-T Display System Time</li> <li>·J· Join Conference(if avail)</li> <li>·W· Extended Commands Menu</li> <li>File ·T·ransfers</li> <li>·..· On-line Programs (Doors)</li> <li>·D·efaults     ·G·-files</li> </ul>	<h3 style="text-align: center;">Message Subs</h3> <ul style="list-style-type: none"> <li>·*· List Available Subs</li> <li>·R·emove a Message</li> <li>·P·ost a Message</li> <li>·&gt;,+· Advance one Sub #</li> <li>·&lt;,-· Retreat one Sub #</li> <li>·N·ew Message scan</li> <li>·Q· N-Scan Current Sub</li> <li>·S·can Message Titles</li> <li>·Z· Continuous N-Scan</li> <li>Goto Sub # Pressed</li> </ul>
<h3 style="text-align: center;">Electronic Mail</h3>	
<ul style="list-style-type: none"> <li>·F·eedback to Sysop</li> <li>·M·ailbox scan</li> <li>·E·-Mail a User</li> <li>·K·ill E-mail You sent</li> </ul>	
<h3 style="text-align: center;">Misc Commands</h3>	
<ul style="list-style-type: none"> <li>·A·uto-Message</li> <li>Log ·O·ff</li> <li>·Y·our info</li> <li>·U·ser List</li> <li>·B·BS List</li> <li>·C·hat with Sysop</li> <li>·V·oting Booth</li> <li>System ·I·nfo</li> <li>·L·ast Callers Today</li> <li>·X·Toggle Expert/Novice</li> </ul>	

# 1979: Multiplayer Games

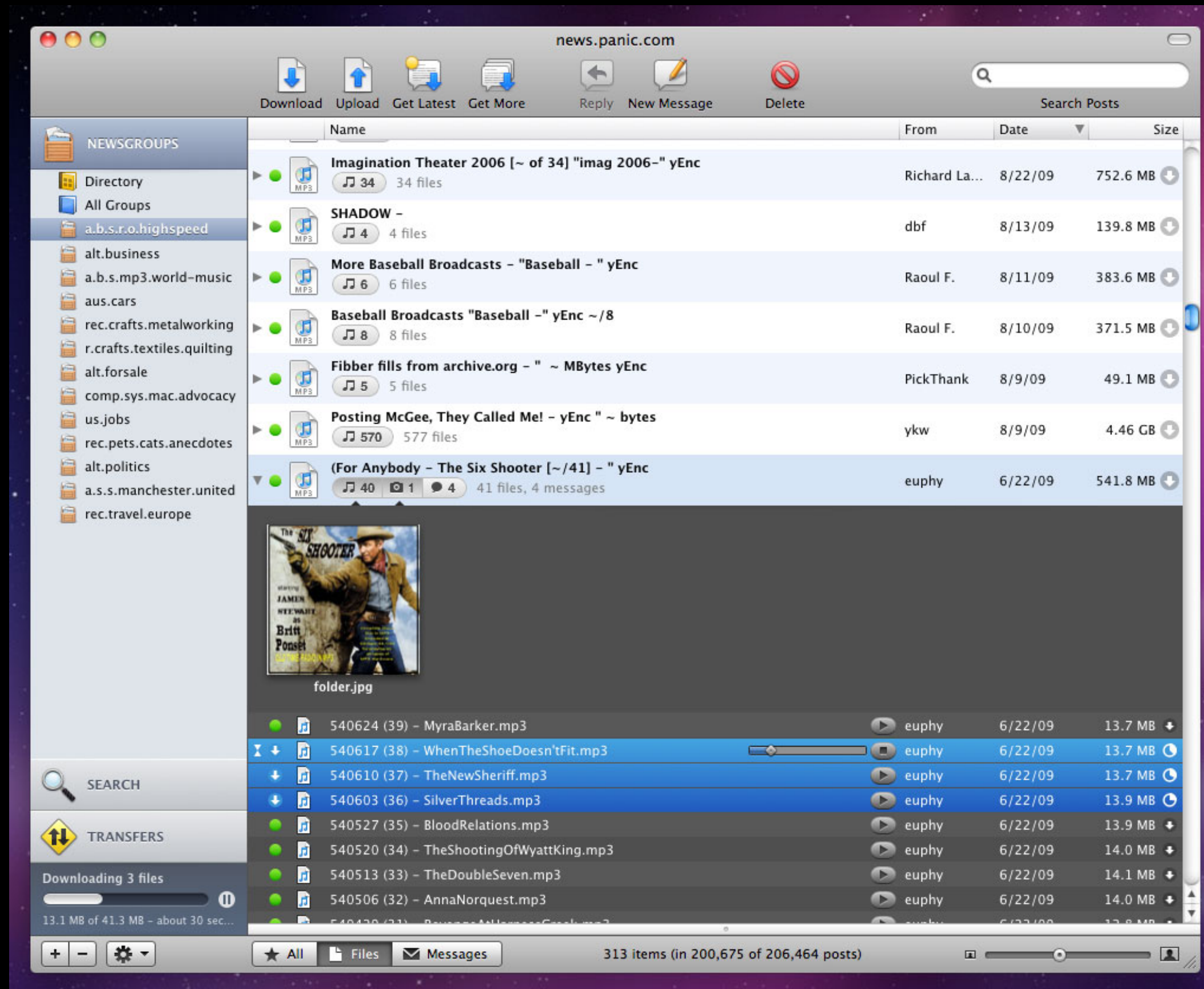
A screenshot of a Telnet window titled "Telnet british-legends.com". The window displays a text-based game interface with the following text:

```
*n
Path.
You are standing on a path which leads off a road to the north, to a cottage
south of you. To the west and east are separate gardens.
*W
Flower garden.
You are in a well-kept garden. There is an unexpectedly sweet smell here and
you notice lots of flowers. To the east across a path there is more garden.
*W
Cliff.
You are standing on the edge of a cliff surrounded by forest to the north and
a river to the south. A chill wind blows up the unclimbable and unscaled
heights. At the base of the cliff you can just make out the shapes of jagged
rocks.
*W
As you approach the edge of the cliff the rock starts to crumble. Hurriedly
you retreat as you feel the ground begin to give way under your feet!
*leap
You are splattered over a very large area, or at least most of you
is. The rest of your remains are, even now, being eaten by the seagulls
(especially your eyes). If you'd have looked properly before you leaped you
might have decided not to jump!
Persona updated.
Would you like to play again?
:
```

MultiUser Dungeons (MUDs) were entirely text-based virtual worlds, combining elements of role-playing games, interactive, fiction, and online chat.



# 1980: usenet



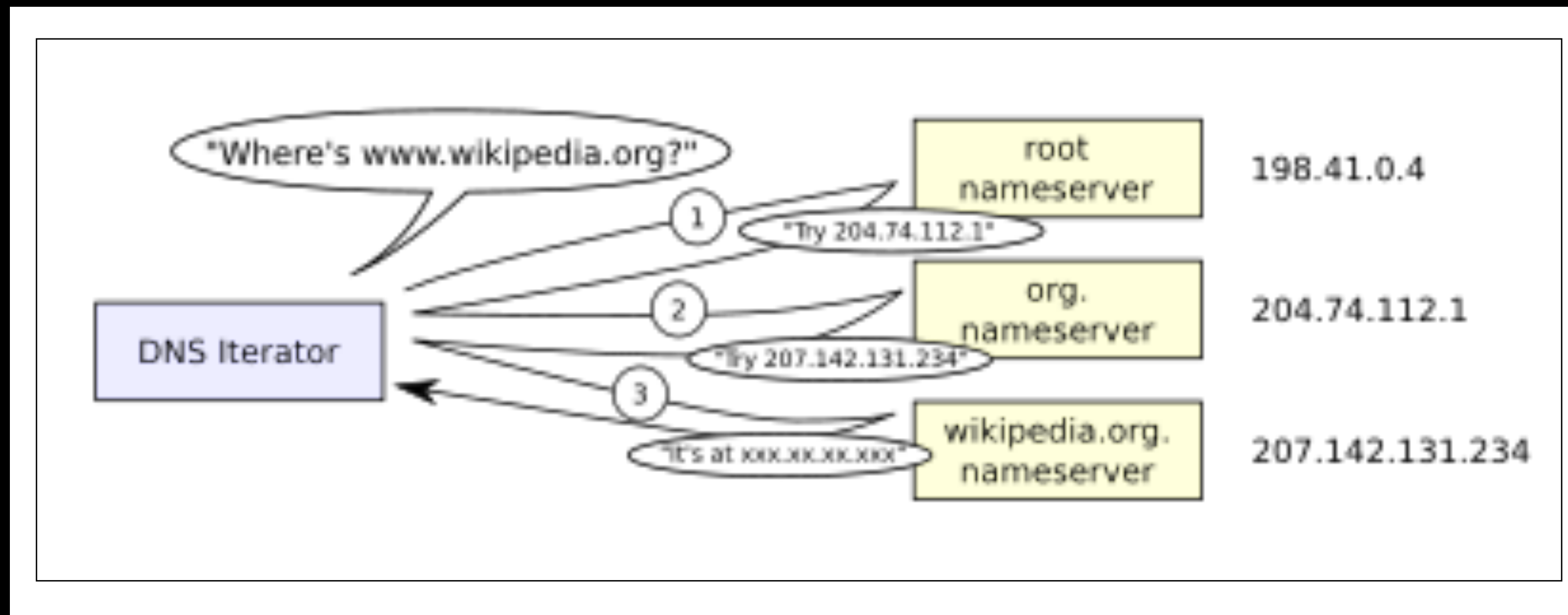
Usenet / News, 1980. Distributed discussion system.

# 1982: The 1st Emoticon

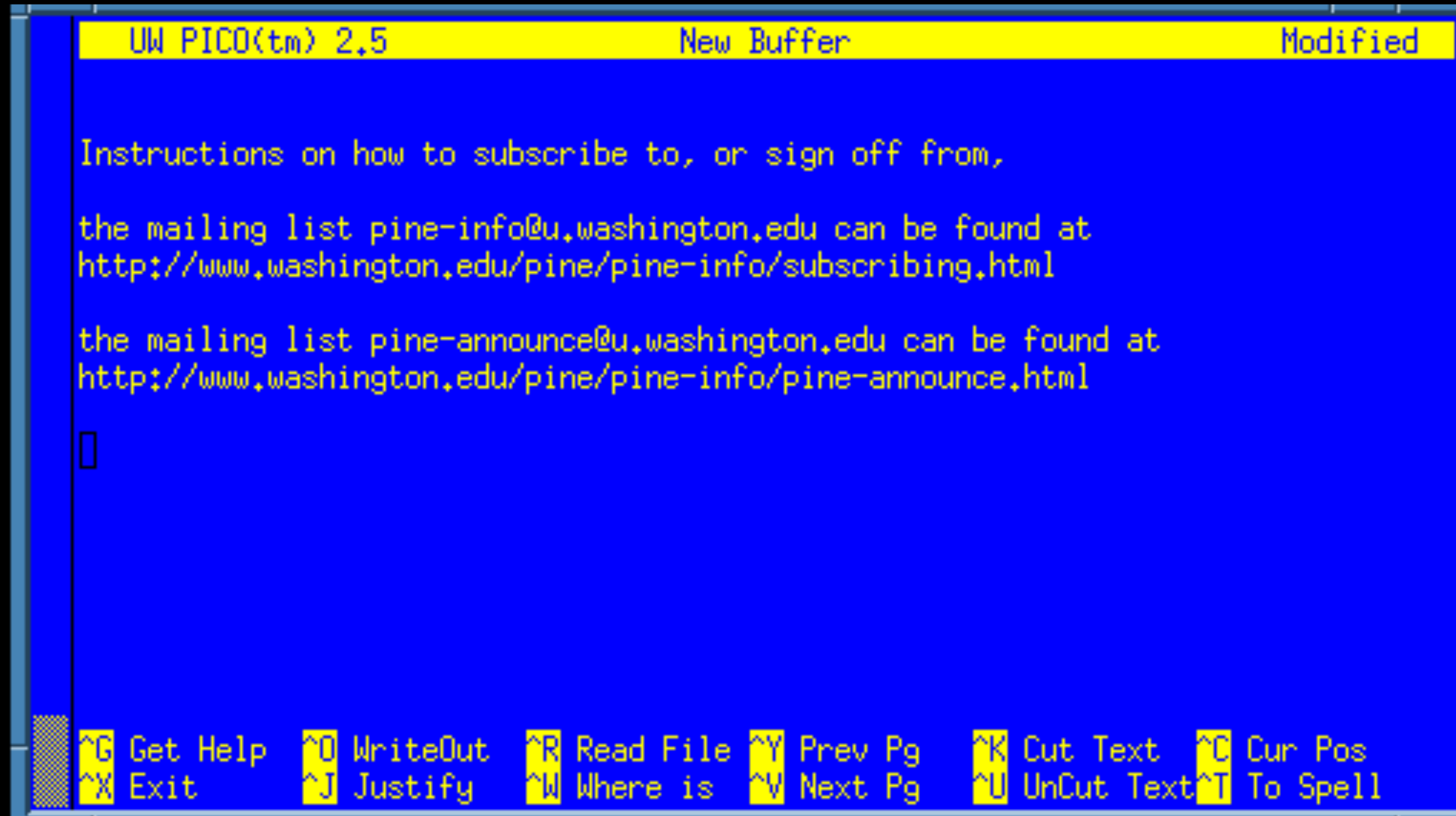


Kevin MacKenzie invented the -) emoticon in 1979, but Scott Fahlman in 1982 proposed using :-) after a joke, rather MacKenzie's original

# 1984: The Domain Name System (DNS)

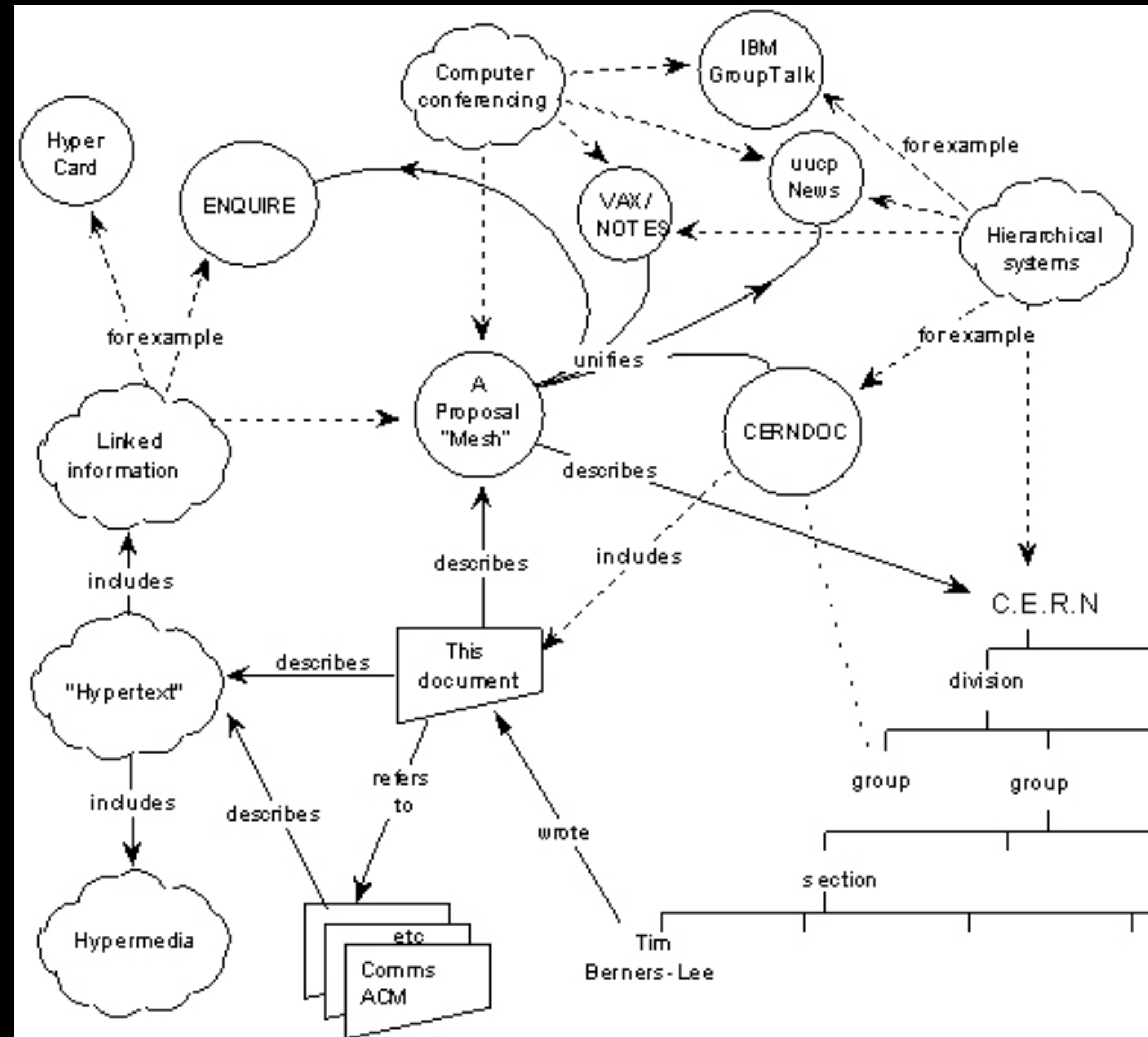


# 1989: AOL



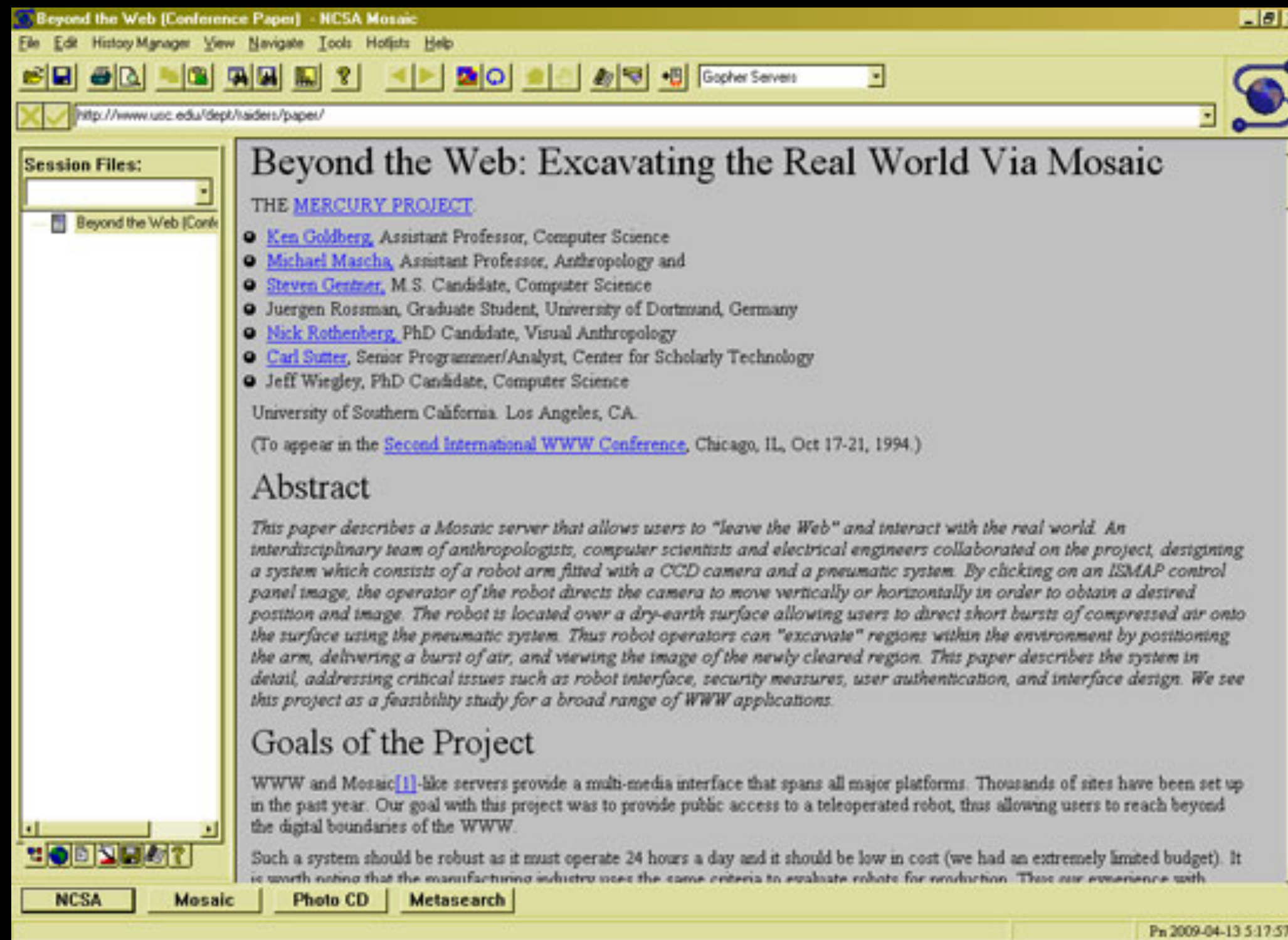
Began as the Apple-sponsored AppleLink program.

# 1989: WWW



Tim Berners-Lee. Originally published in MacWorld magazine, and then redistributed in May 1990. Originally called "Mesh".

# 1993: Mosaic



First graphical web browser for the general public, Funded in part, along with other commercial net projects, though the advocacy of Congressman Al Gore.

# 1994: Netscape Navigator



Mosaic's first big competitor.

# 1998: Google





# 1998: P2P File-Sharing

The screenshot displays the Napster v2.0 BETA 7 application window. The interface includes a menu bar (File, Actions, Help) and a toolbar with buttons for Home, Chat, Library, Search, Hot List, Transfer, Discover, and Help. The main area is a table of file transfers with columns for Filename, File Size, User, Status, Speed, Progress, Rate, and Time Left. A large Napster logo watermark is overlaid on the center of the screen.

Filename	File Size	User	Status	Speed	Progress	Rate	Time Left
Comedy - Maclean & Maclean - The Gross Manual (14 Sure Fee Jo...	299,200 of 2,220,560	ldhull	Downloading...	Unknown	13%	5.06 k/s	00:06:19
(Comedy) Maclean & Maclean - Johnny Marijuana Seed .mp3	270,049 of 7,381,800	mbrin	Downloading...	Cable	3%	6.50 k/s	00:18:13
Comedy - Maclean & Maclean - The Gross Manual (14 Sure Fee Jo...	539,936 of 2,220,560	big_bang_	Downloading...	Cable	24%	7.33 k/s	00:03:49
MacLean and Maclean - Bowser and Blue.mp3	5,606,005	ade_n	Getting Info...				
Andrews Sisters - Little Toot.mp3	375,392 of 8,528,129	F4phantom_	Downloading...	DSL	4%	4.14 k/s	00:32:50
70's CHILDREN'S STORY RECORD - LITTLE TOOT .mp3	89,512 of 5,840,561	dude_way	Downloading...	14.4	1%	1.10 k/s	01:26:59
Disney Parks Toontown-Little Toot.mp3	64,608 of 2,354,597	hitmebiter	Downloading...	Cable	2%	1.28 k/s	00:29:47
Maclean & Maclean - Little Toot.MP3					3%	0.24 k/s	00:41:39
Disney Parks Toontown-Little Toot.mp3					8%	5.82 k/s	00:06:12
Maclean & Maclean - Little Toot.mp3					24%	4.44 k/s	00:02:31
Big Tiny Little & Mickey Finn - Toot Toot Tootii.mp3					1%	1.89 k/s	00:25:08
Comedy - Maclean & Maclean - Little Toot.mp3					0%	0.55 k/s	00:26:45
Brenda Lee - Toot Toot Tootsie Goodbye [Little Miss					1%	1.10 k/s	00:33:26
MacLean & MacLean - Little Toot [edit].mp3					9%	4.68 k/s	00:03:47
Maclean & Maclean - Little Toot.mp3	882,688	raybauduc	Getting Info...				

Filename	File Size	User	Status	Speed	Progress	Rate	Time Left
Crosby, Stills, Nash And Young - Ohio.Mp3	2,725,888 of 3,709,496	cybermoose	Uploading...	56K	73%	1.55 k/s	00:10:33
lollipop lust kill - jesus chrysler.mp3	3,339,493	4StringMF	File Complete!				
Simpsons - The Life Of Homer Simpson.mp3	1,406,976 of 2,756,736	soldude67	Uploading...	56K	51%	1.45 k/s	00:15:30
Fear Factory - Cars.mp3	3,921,141	tubbedbird	File Complete!				
Comedy - Richard Pryor - New Niggers.mp3	3,795,451	tubbedbird	File Complete!				
Unknown - Mopar (Chrysler) 440 6-pak V8 race-buit - real men don't...	869,049	TYLERSEX...	File Complete!				
Comedy - Jerky Boys - Fanning My Balls.mp3	675,840 of 1,784,264	tubbedbird	Uploading...	14.4	38%	7.33 k/s	00:02:31
Ben Stiller & Andy Dick - Can We Get It Together Again.mp3	1,230,600	fluidpockets...	Waiting...				

# 2000: The Bubble Bursts



The dotcom collapse resulted in huge losses and the closing of hundreds of companies, some of which had never turned a profit.

# 2001: Wikipedia



The screenshot shows the Wikipedia Main Page as it appeared in early 2001. On the left is a sidebar with navigation links and the Wikipedia logo. The main content area features a 'Main Page' heading, a welcome message, and information about the project's history and goals.

**WIKIPEDIA**  
The Free Encyclopedia

[Main Page](#)  
[Recent changes](#)  
[Random page](#)  
[Watch list](#)  
[Current events](#)

**Protected page**  
[Talk page](#)  
[History](#)  
[What links here](#)  
[Watch links](#)

[Main Page](#) | [Recent changes](#) | [Protected page](#) | [History](#) |

[Printable version](#)

Other languages: [German](#) | [Esperanto](#) | [Spanish](#) | [French](#) | [Dutch](#) | [Polish](#) | [Portuguese](#)

## Main Page

From Wikipedia, the free encyclopedia.

**Welcome to Wikipedia**, a collaborative project to produce a complete [encyclopedia](#) from scratch. We started in January [2001](#) and are already on [48152 articles](#), with more being added and improved all the time, including *you*, can edit any article right now, without even having to copyedit, expand an article, write a little or write a lot. See the [Wikipedia:Welcome](#) page for more background information about the project, and the [help page](#) on how to use and contribute to Wikipedia.

The content of Wikipedia is covered by the [GNU Free Documentation License](#), which means that it is free and will remain so forever. See [Wikipedia:Copyrights](#) for the details and [Wikipedia:Copyrights and Fair Use](#) for background.

Paved the way for collective web content generation/social media.

# 2003: VoIP

Skype

# 2004: Web 2.0



Digg, a social news site, launched on November of 2004, paving the way for sites such as Reddit, Mixx, and Yahoo! Buzz.

# 2004: The Facebook

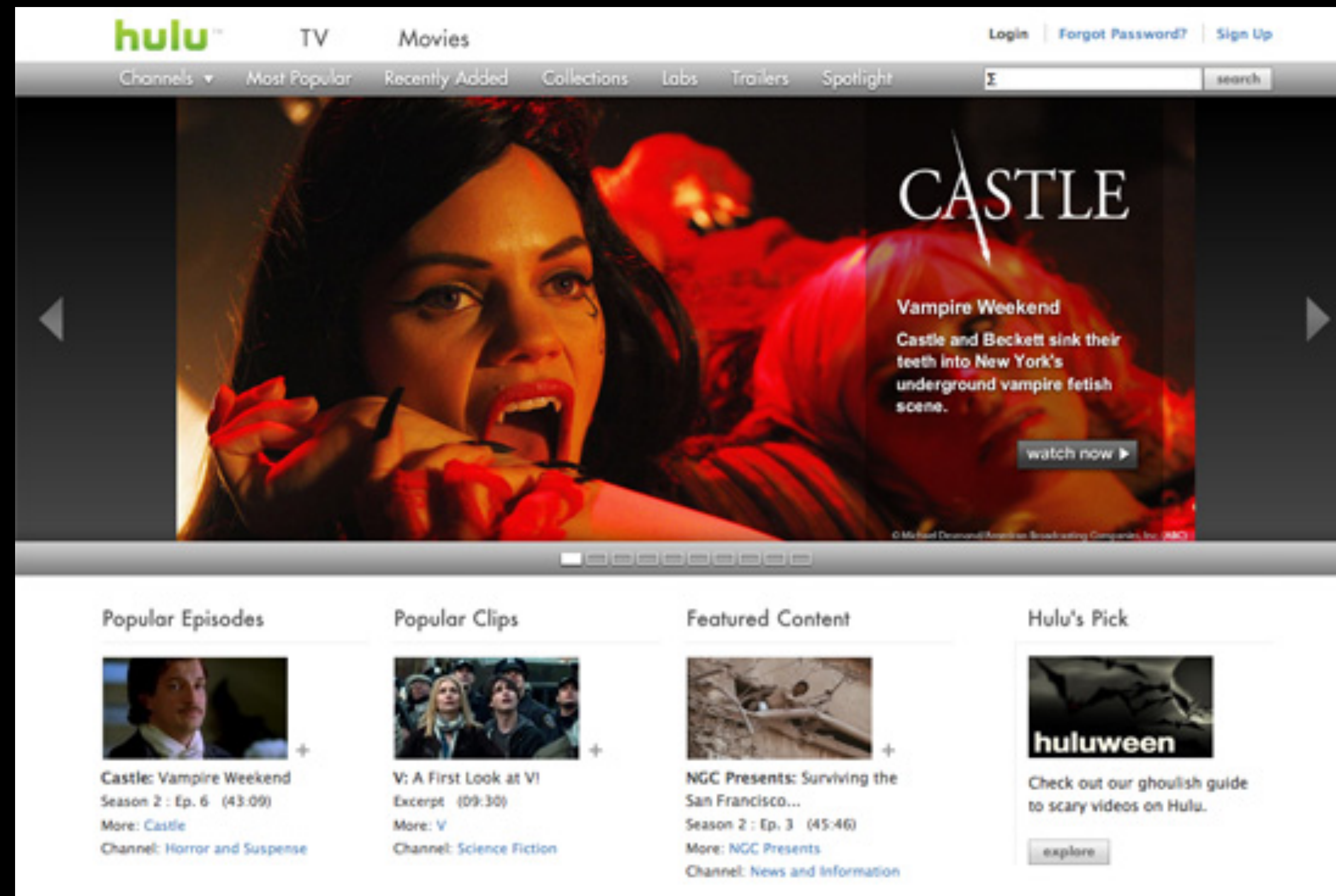


2005: YouTube

**2006: Twitter**



# 2007: Online Movies



Hulu began as a joint venture between ABC, NBC, and Fox.

# 2007: iPhone and Mobile Web



# world wide web

## Protocol

- **Client** browser requests a page from a Web **server** using a **URL**. URLs are resolved through **DNS** servers. Server sends page to client browser via **HTTP**, which displays the page based on HTML and CSS.

## Structure & Semantics

- **HTML**: text “marked-up” with tags that are rendered/interpreted by your browser. Some elements define *structure*, like headings and paragraphs, while other *semantic* elements describe extra info, like where to place emphasis in a sentence.

## Form/Appearance

- **CSS**: controls the appearance and position of structural elements, text and images

## Behavior

- **JavaScript**: Advanced interaction controls, special effects. Processed by the browser.

# WWW – HTML

HTML provides the **Structure** of the content.

Basic anatomy of an HTML Page:

```
<html>
```

```
<head>
```

```
<title>This is a title.</title>
```

```
</head>
```

```
<body>
```

```
  <p>This is the content of the Web page.</p>
```

```
</body>
```

```
</html>
```

# common HTML tags

<h1> through <h6> Head 1 through Head 6

<p> paragraph

<ul> unordered list (bullets)

<ol> ordered list (numbered)

<li> list items

<em> emphasis (italic)

<strong> bold

<div> division (container)

<span> range of selected text

<table> array of data

<tr> table row

<td> table data

<a> anchor (links)

# WWW – CSS

CSS provides the **Style** of the content.

Basic anatomy of a CSS document:

```
selector {  
    property: value;  
}
```

such as:

```
body {  
    background-color: #d5d7ff;  
    text-align: left;  
    font: 11px "Lucida Grande", Verdana, sans-serif;  
}
```

# Kinds of CSS Selectors

- TYPE is applied to specific HTML tags
  - h1, p, ul, ...
- CLASS is applied to any range of text
  - .blue, .boldRed, ...
- COMPOUND can be applied to specific tags and classes depending on context
  - h1.blue (only applies to .blue classes inside an h1 tag)

# some CSS properties

**color**

**text-align**

**line-height**

**font-family**

**font-size**

**font-style**

**font-weight**

**background-color**

**background-image**

**list-style-type**

**margin**

**padding**

**border**



# Access/Accessibility

## **Net Neutrality**

“Information wants to be free”

## **Digital Divide**

equipment, infrastructure, education

## **Disability**

Physical and cognitive

# Web Standards

- Govern the “interoperability, accessibility and usability of web pages and web sites”
- When a page complies with standards, it validates as proper HTML, CSS and JavaScript, and meets accessibility and semantic guidelines.

# net neutrality

**“Ten movies streaming across that  
that, internet, and what happens  
to your own personal internet?”**



**Sen. Ted Stevens (R-Alaska)**

# net neutrality



Implications of losing Net Neutrality

# net neutrality

## FCC slams AT&T and Verizon over zero-rating offers

The Federal Communications Commission is not cool with AT&T's offer that lets customers stream the carrier's DirecTV service without it counting against their data plans. The commission has also launched an investigation into a similar offer from Verizon.

In a letter sent to AT&T on Thursday, the agency said it's reached a preliminary conclusion that the carrier is violating net neutrality rules, which prohibit internet service providers from favoring their own content over a competitor's service.

Since September, AT&T has let its wireless customers stream its DirecTV video service over the AT&T wireless network without counting that data against their monthly data caps. This week AT&T made the \$35 a month streaming service available to all wireless customers. The FCC also sent a letter to Verizon asking it questions about a similar offer where Verizon lets customers stream its Go90 video service and doesn't charge for data usage.

CNET Article

# net neutrality

“A core issue to net neutrality is how ISPs should be classified under the Communications Act of 1934, if they should be Title I "information services" or Title II "common carrier services". The classification affects the Federal Communication Commission's (FCC) authority over ISPs: the FCC would have significant ability to regulate ISPs if classified as Title II common carriers, but would have little control over them if classified as Title I.

Because the Communications Act has not been amended by the United States Congress to account for ISPs, the FCC has the authority to designate how ISPs should be treated in addition to what regulations they can set on ISPs. The makeup of the 5-member FCC has changed with each new administration, leading to the state of net neutrality flipping back and forth over the last two decades.”

# net neutrality

"In 2005, the FCC adopted network neutrality principles "to preserve and promote the vibrant and open character of the Internet as the telecommunications marketplace enters the broadband age." Between 2005 and 2012, five attempts to pass bills in Congress containing net neutrality provisions failed. Opponents claimed that these bills would have benefited industry lobbyists instead of consumers. In response to legal challenges from ISPs challenging the FCC's ability to set net neutrality principles, the FCC in 2015 issued the Open Internet Order which reclassified ISPs as Title II services and giving them authority to enforce net neutrality.

In 2017 as part of the Trump Administration, Ajit Pai proposed to repeal the neutrality policies, returning to the previous classification of ISPs as Title I services. The draft of the proposed repeal, published in May 2017, led to over 20 million comments to the FCC. Despite a majority of these favoring retaining the 2015 Open Internet Order, the FCC still voted in favor of repealing the Order, which went into effect in June 2018 despite efforts in Congress to stay the repeal.[5] As a result, over 20 states launched a joint lawsuit against the FCC, while California passed its own state-level net neutrality law that is being challenged by the federal government."

# Privacy/Security

- Personal control of shared info
- The right to know how a company is collecting and using your data
- Use of your data to send you personalized ads, determine behaviors, identify location, health issues...



# Control/Censorship

“The first principle of a free society is an untrammelled flow of words in an open forum.”

—Adlai Stevenson, 1962

“Once a government is committed to the principle of silencing the voice of opposition, it has only one way to go, and that is down the path of increasingly repressive measures, until it becomes a source of terror to all its citizens and creates a country where everyone lives in fear.” —Harry S. Truman, 1950

# SOPA, PIPA & CISPA

Cyber Intelligence Sharing and Protection Act—Gives Internet companies carte blanche to spy on their customers.

Would hurt the economy, remove privacy rights, and ultimately hurt security, rather than enhancing it.

# Browsers

- Which to choose: speed, data sync...
- Desktop and Mobile apps
- Ad blockers
- Trackers
- Anonymity/VPN

# Net Art

- Hyperallergic: [“Best of 2015: Our Top 10 Works of Internet Art”](#)