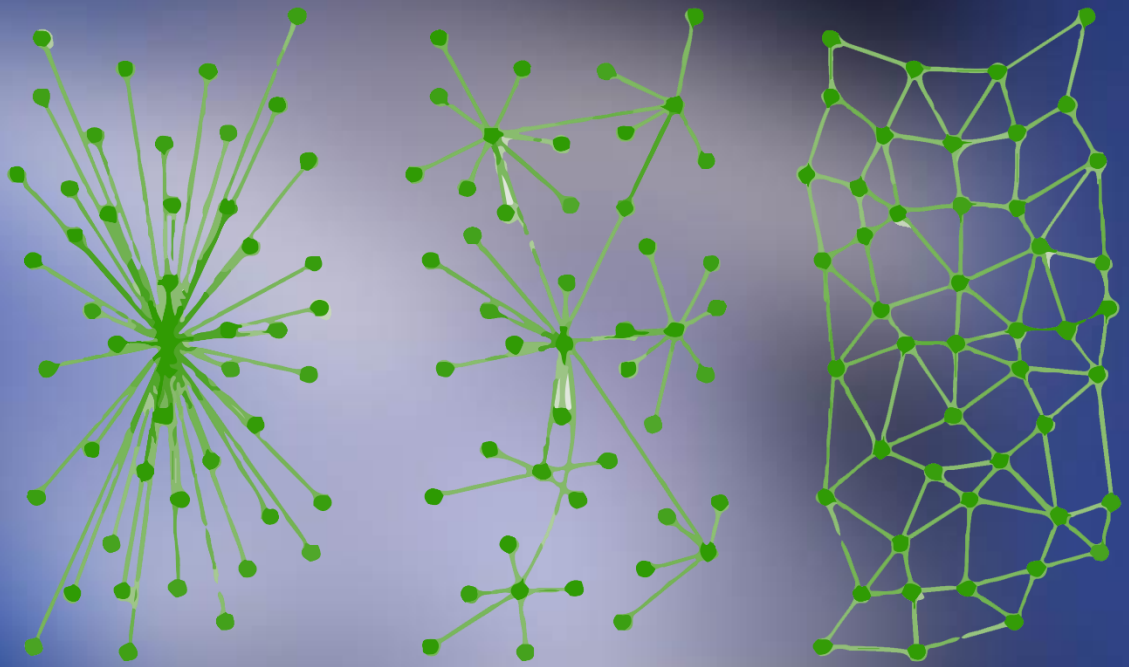
# History of Computer Networks

**Presented by Group #1:**
**Jay, Natasha, Mario and Edbert.**

# The 1950s – 1970s

# Paul Baren's Digital packet-switching system

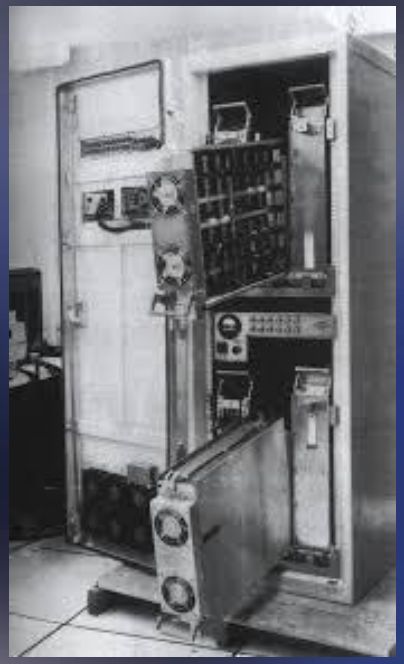
- Highly distributed
- Robust
- No centralized system
- Fault-tolerant
- Dismissed by AT&T because they think it was unfeasible

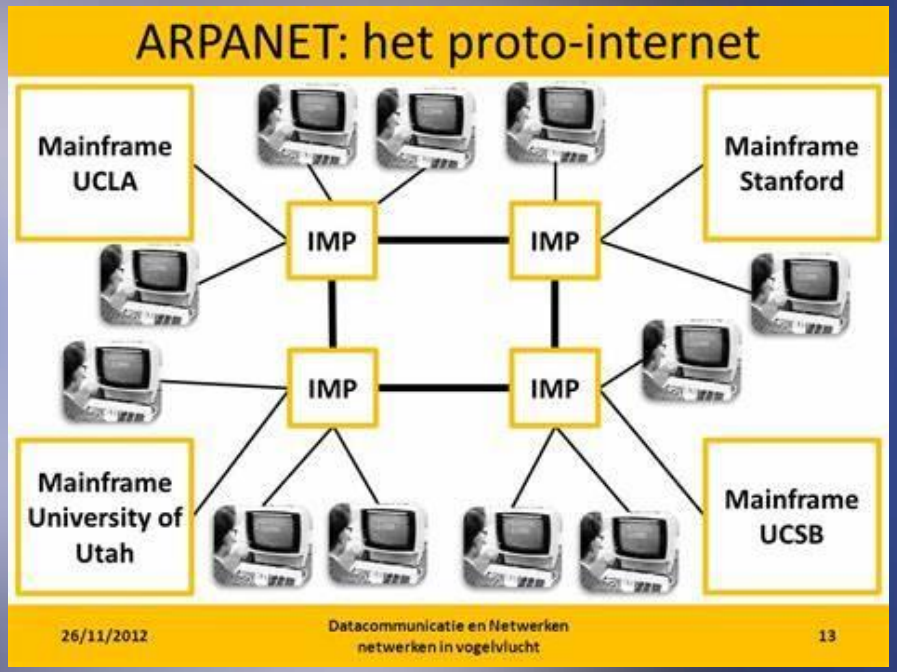


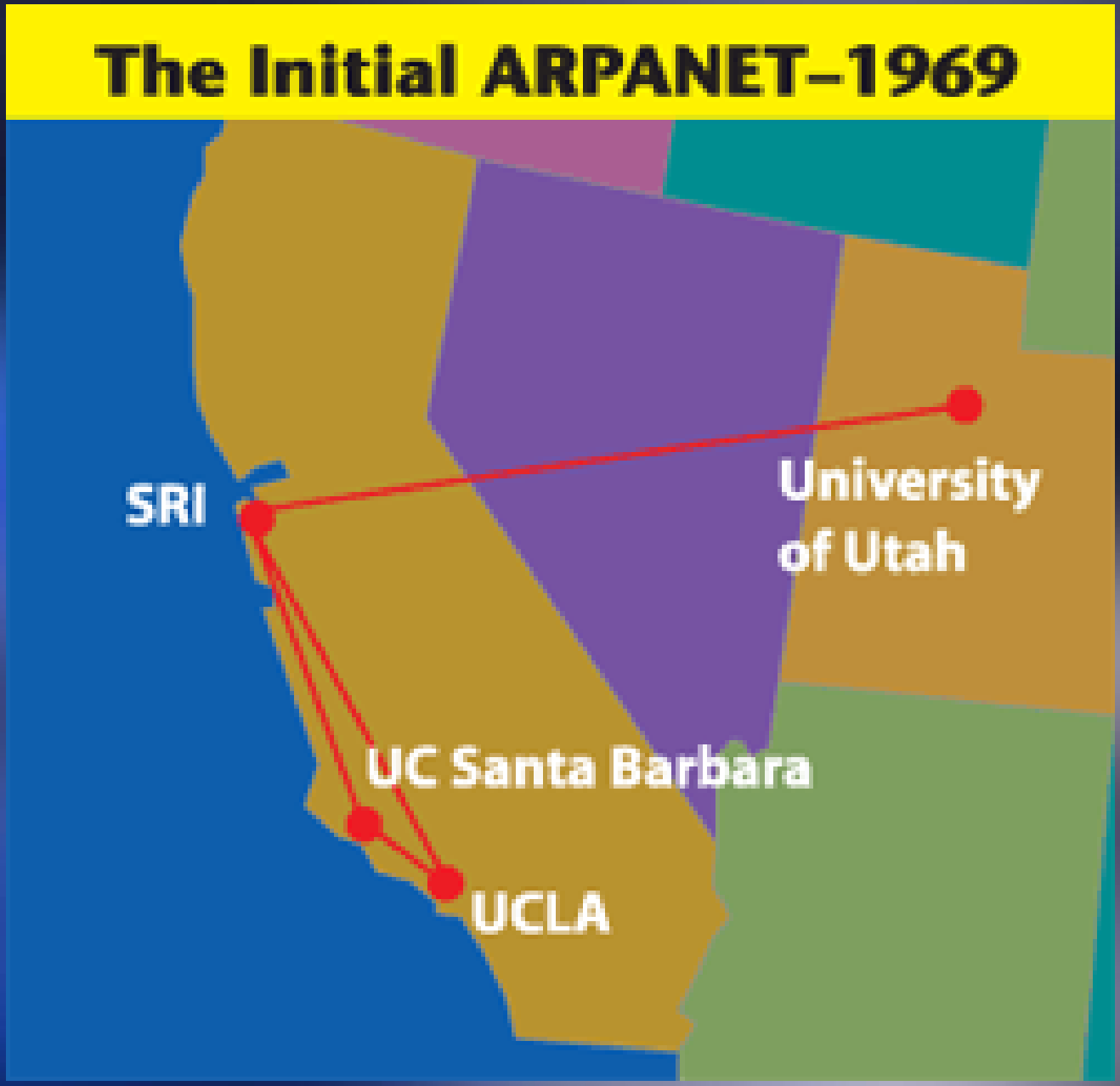
# Start of ARPA – Advanced Research Project Agency

# ARPANET

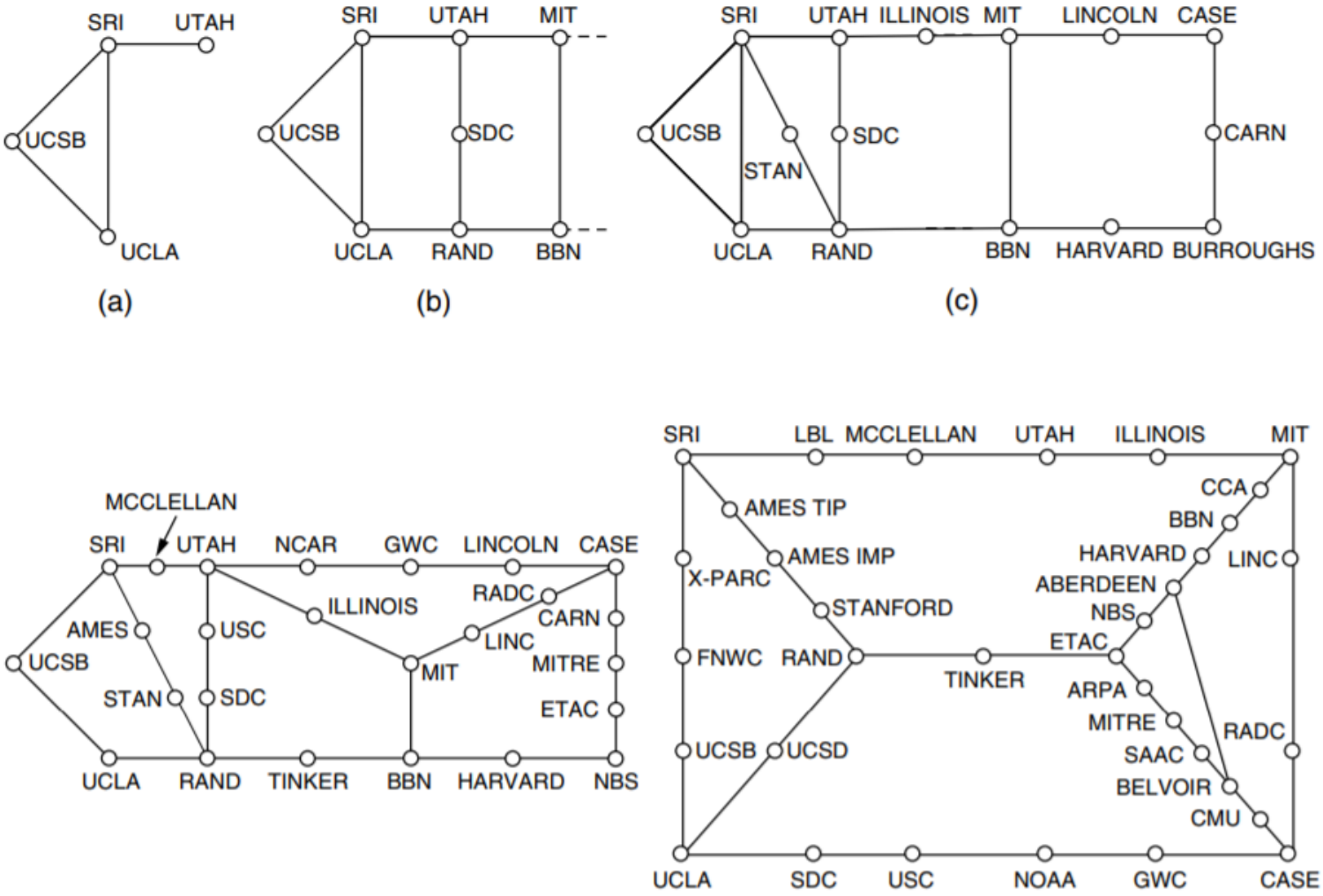
- 1967: Leonard Roberts of ARPA publishes plan for the first computer network system – the ARPANET.
- Packet switches were needed called Interface Message Processors (IMP).
- 1969: IMPs installed in UCLA, Stanford, UCSB and Utah.






The Initial ARPANET–1969
SRI
University
of Utah
UC Santa Barbara
UCLA

# Growth of ARPANET



# CYCLADES Network

- Developed in France.
- 1st network to make hosts responsible for reliable data delivery.
- Introduced new concepts.
- Because CYCLADES no longer had to ensure the correct delivery of data, this greatly simplified the design.

# The 1980s

# 1979 - 1990s: 1G

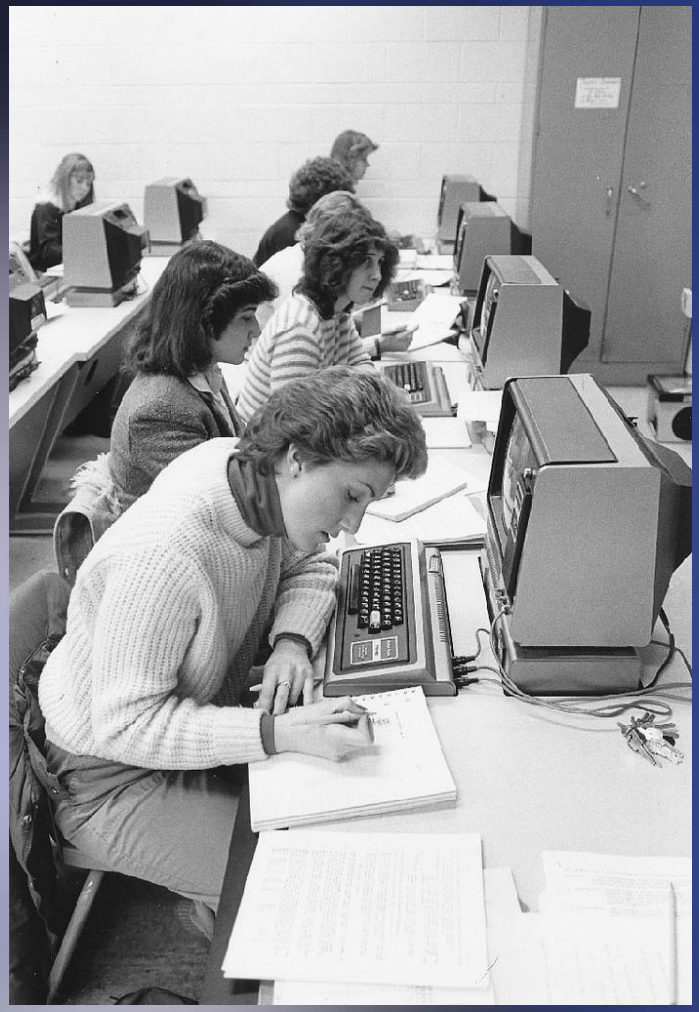
- Analog communications standards
- Used in most modern countries until 2G
- 150 MHz +

# 1984: Standardization of TCP/IPv4

- Designed in 1974, deployed in 1981, standardized in 1984
- Uses 32 bit address size, for a total of just over 4 billion addresses
- 5 different classes

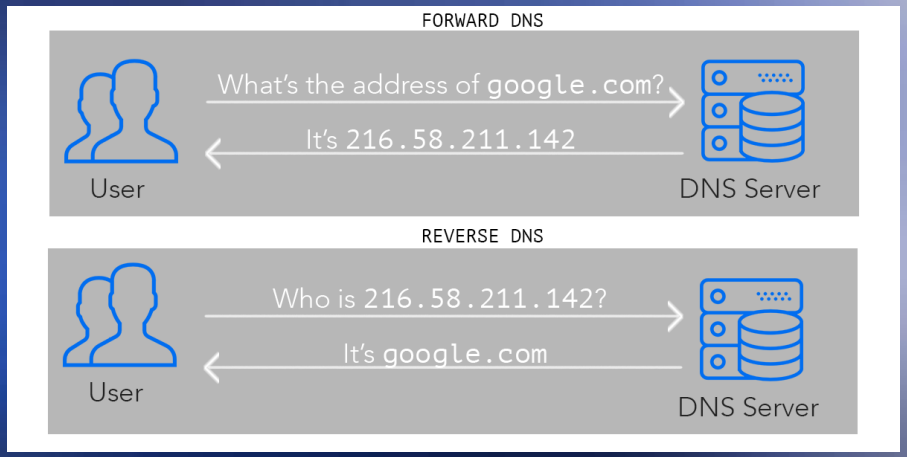
# 1983 - present: MIT's Athena

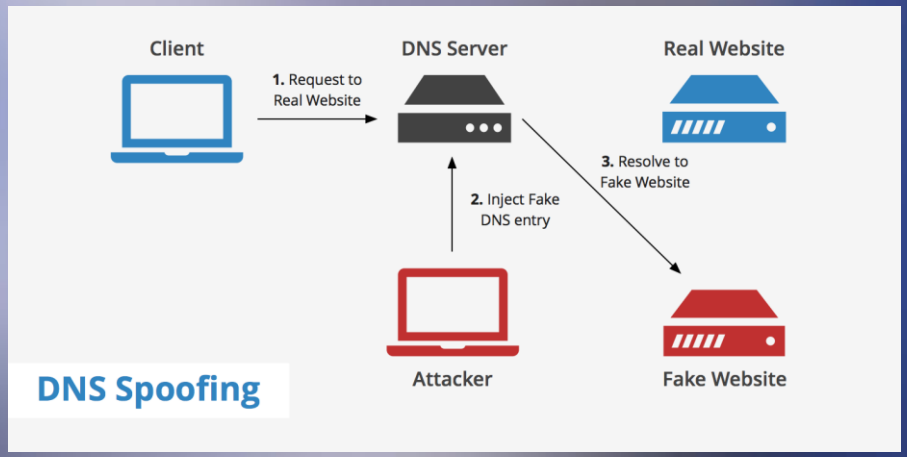
- Campus wide LAN
- Pioneered client-server model
- Was the inspiration for Dropbox



# 1984: DNS


- more effective routing system
- resilient to hacks
- support email growth
- specify a receiver instead of the route



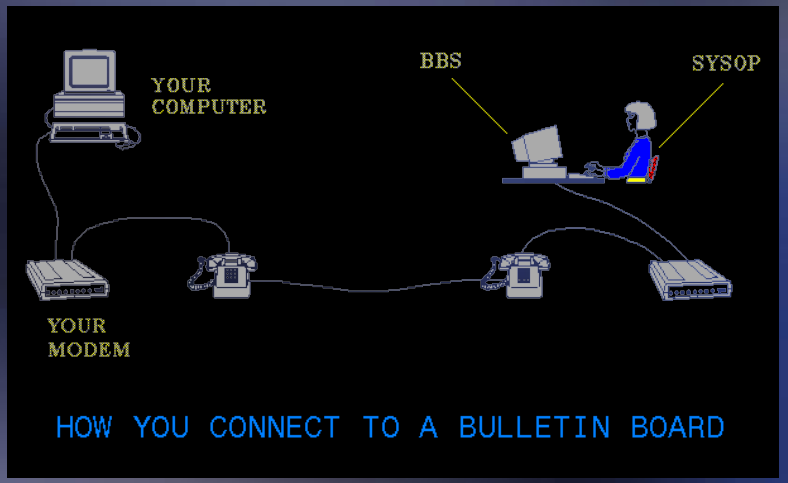



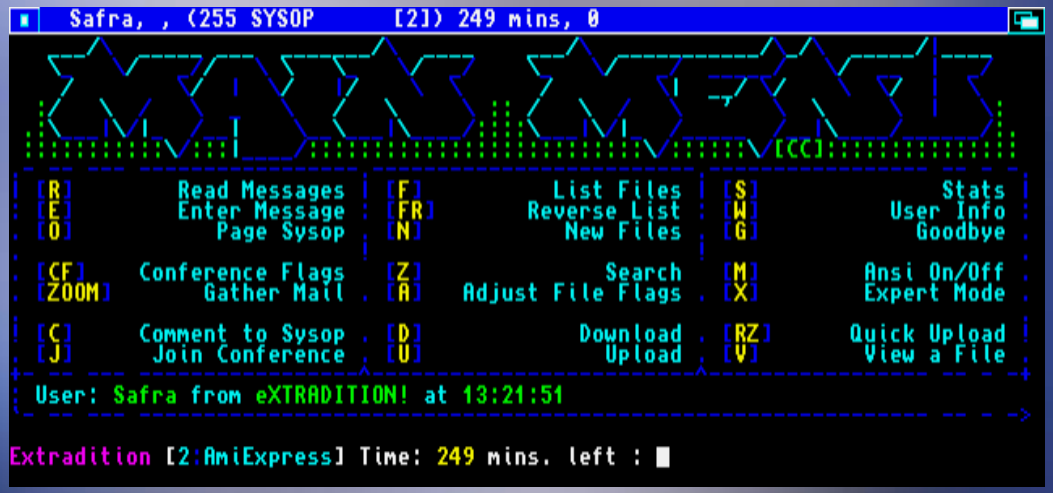
# 1985: AppleTalk

- Easily accessible
- Less complicated
- User friendly
- Cheap


# 1978 - 1990s: BBS

- Share software, Data, News
- Play games
- Instant Messaging

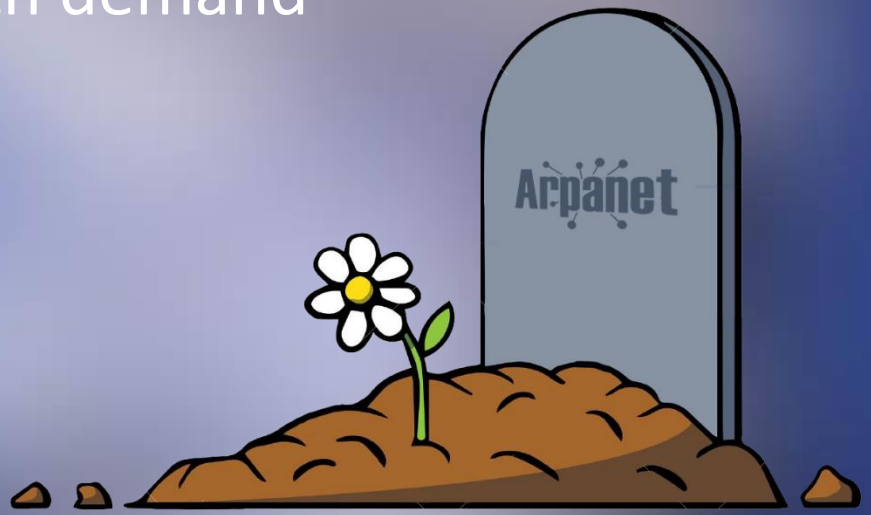


# The 1990s

# The end of ARPANET

- Other networks start popping up
- USENET
- CSNET
- BITNET
- IMPs couldn’t keep up with demand
- The advent of NSFNET



# WaveLAN


Lucent Technologies
Bell Labs Innovations

AT&T

- The Wi-Fi predecessor
- Released in 1990
- Proprietary standard
- 915MHz or 2.4GHz
- A speed of 2Mbps
- Deprecated in 2000

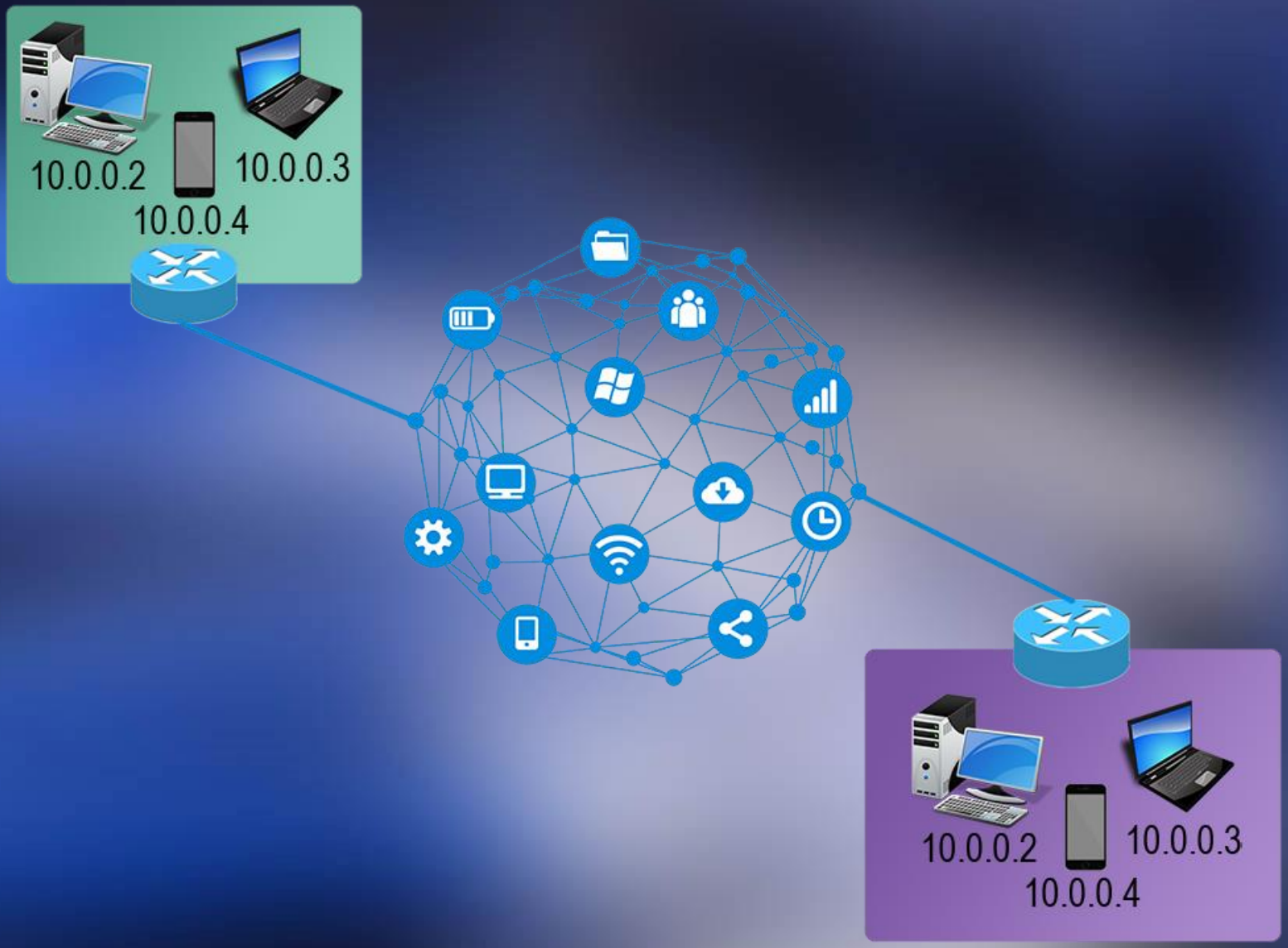
WAVELAN

# The World Wide Web

- Uniform Resource Locators
- Hypertext Transfer Protocol
- Hypertext markup language

Tim Berners Lee

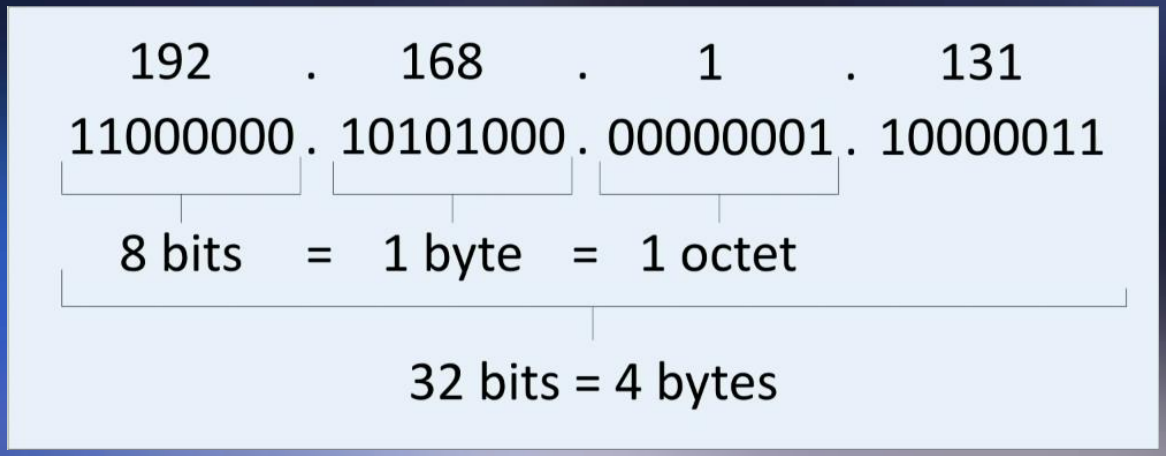
# Classless IP and NAT

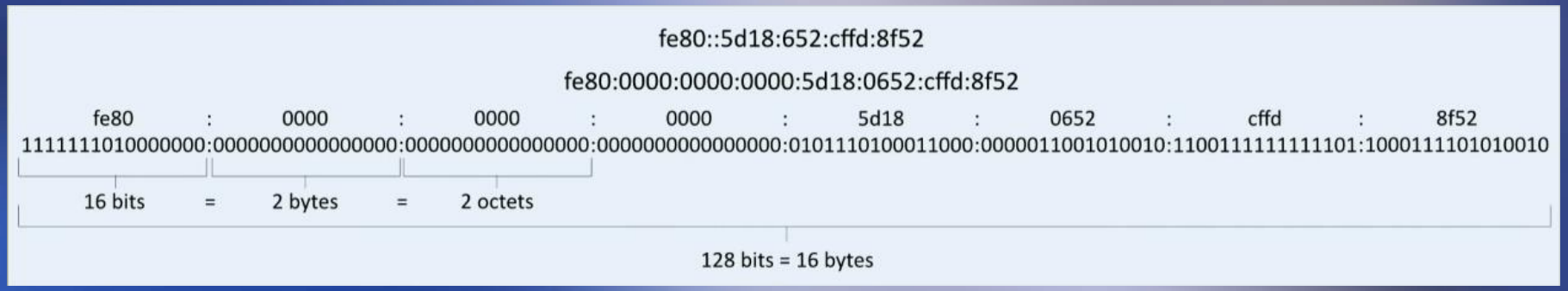


# Search Engines

- Archie
- JumpStation
- WebCrawler
- Yahoo!
- Google
- Baidu

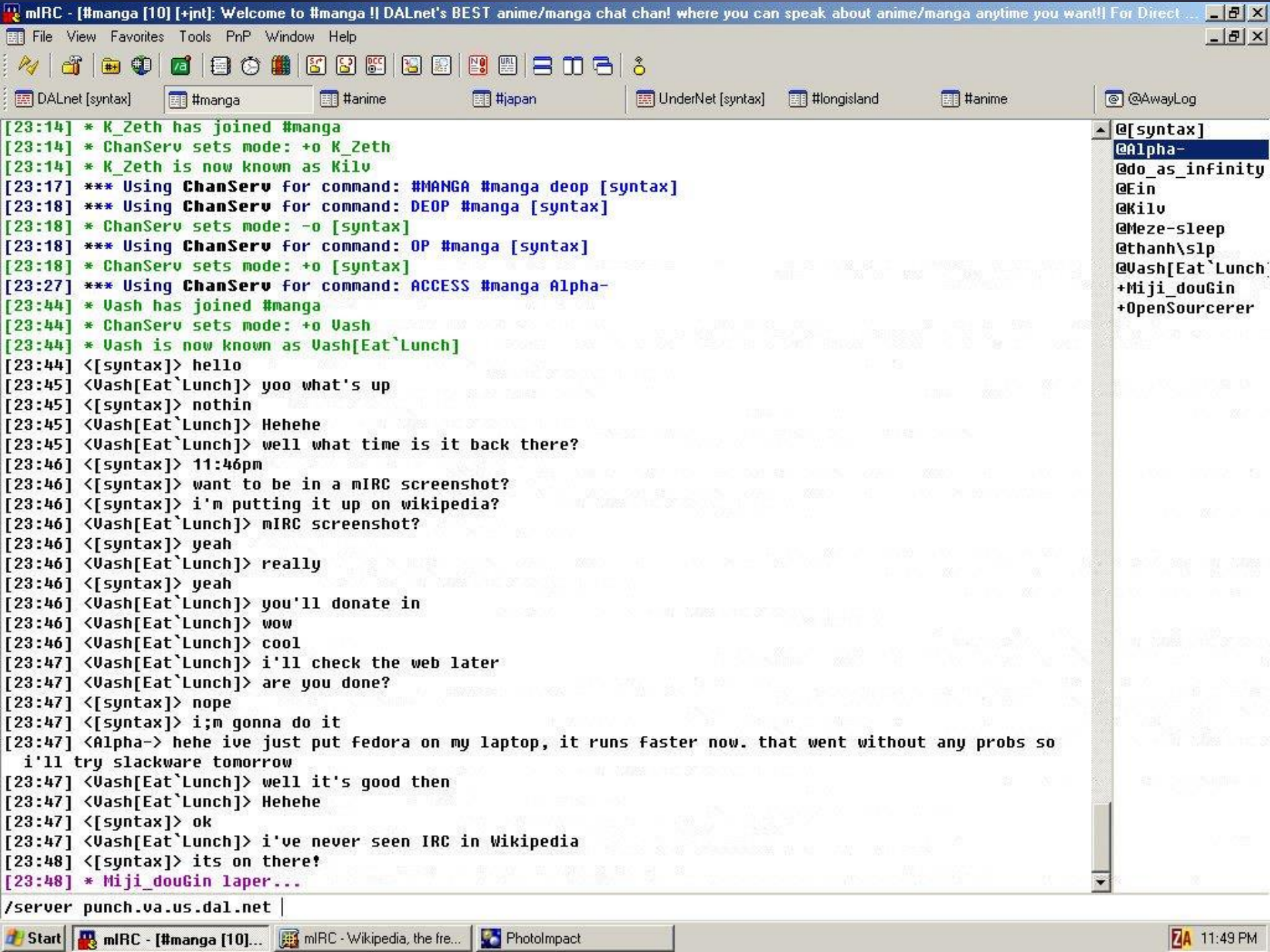
# IPv6 (IPng)


192 . 168 . 1 . 131
11000000 . 10101000 . 00000001 . 10000011
8 bits = 1 byte = 1 octet
32 bits = 4 bytes


fe80::5d18:652:cffd:8f52
fe80:0000:0000:0000:5d18:0652:cffd:8f52
fe80 : 0000 : 0000 : 0000 : 5d18 : 0652 : cffd : 8f52
1111111010000000:0000000000000000:0000000000000000:0000000000000000:0101110100011000:0000011001010010:1100111111111101:1000111101010010
16 bits = 2 bytes = 2 octets
128 bits = 16 bytes

# E-Commerce

- Book Stacks Unlimited
- Netscape made it all happen
- Amazon
- eBay
- AliBaba


mIRC - [#manga [10] [+jnt]: Welcome to #manga !| DALnet's BEST anime/manga chat chan! where you can speak about anime/manga anytime you want!] For Direct ...
File View Favorites Tools PnP Window Help
DALnet [syntax]
#manga
#anime
#japan
UnderNet [syntax]
#longisland
#anime
@AwayLog
[23:14] * K_Zeth has joined #manga
[23:14] * ChanServ sets mode: +o K_Zeth
[23:14] * K_Zeth is now known as Kilv
[23:17] *** Using ChanServ for command: #MANGA #manga deop [syntax]
[23:18] *** Using ChanServ for command: DEOP #manga [syntax]
[23:18] * ChanServ sets mode: -o [syntax]
[23:18] *** Using ChanServ for command: OP #manga [syntax]
[23:18] * ChanServ sets mode: +o [syntax]
[23:27] *** Using ChanServ for command: ACCESS #manga Alpha-
[23:44] * Vash has joined #manga
[23:44] * ChanServ sets mode: +o Vash
[23:44] * Vash is now known as Vash[Eat`Lunch]
[23:44] <[syntax]> hello
[23:45] <Vash[Eat`Lunch]> yoo what's up
[23:45] <[syntax]> nothin
[23:45] <Vash[Eat`Lunch]> Hehehe
[23:45] <Vash[Eat`Lunch]> well what time is it back there?
[23:46] <[syntax]> 11:46pm
[23:46] <[syntax]> want to be in a mIRC screenshot?
[23:46] <[syntax]> i'm putting it up on wikipedia?
[23:46] <Vash[Eat`Lunch]> mIRC screenshot?
[23:46] <[syntax]> yeah
[23:46] <Vash[Eat`Lunch]> really
[23:46] <[syntax]> yeah
[23:46] <Vash[Eat`Lunch]> you'll donate in
[23:46] <Vash[Eat`Lunch]> wow
[23:46] <Vash[Eat`Lunch]> cool
[23:47] <Vash[Eat`Lunch]> i'll check the web later
[23:47] <Vash[Eat`Lunch]> are you done?
[23:47] <[syntax]> nope
[23:47] <[syntax]> i;m gonna do it
[23:47] <Alpha-> hehe ive just put fedora on my laptop, it runs faster now. that went without any probs so i'll try slackware tomorrow
[23:47] <Vash[Eat`Lunch]> well it's good then
[23:47] <Vash[Eat`Lunch]> Hehehe
[23:47] <[syntax]> ok
[23:47] <Vash[Eat`Lunch]> i've never seen IRC in Wikipedia
[23:48] <[syntax]> its on there!
[23:48] * Miji_douGin laper...
@[syntax]
@Alpha-
@do_as_infinity
@Ein
@Kilv
@Meze-sleep
@thanh\slp
@Vash[Eat`Lunch]
+Miji_douGin
+OpenSourcerer
/server punch.va.us.dal.net
Start
mIRC - [#manga [10]...
mIRC - Wikipedia, the fre...
PhotoImpact
11:49 PM

# Wi-Fi

- Initially released in 1997.
- 11(+2) channels of operation
- 802.11b and 802.11g standards

# 2nd Gen Cellular Tech

- Encryption
- More users per frequency band
- SMS

# The 2000s

# Main Events of 2000s

**The Millennium Bug**

Also known as the Y2K bug

**Rise and fall of Dot-coms**

The bubble that is dot-coms companies and the bursting of that bubble

**Rise of P2P Network**

Yo ho, yo ho the pirate life is the life for me

**Start of user-contents**

Things such as google and youtube, ~~also don't forget to smash that subs button~~

**WEP**

Security standard that were not so secure

**Cloud Computing**

Computing in more virtual matter

**Rise of Malicious attacks**

The rise of cyber threats and attacks

**3G**

Fun fact: before 4G there was 3G.

# Millenium Bug (AKA Y2K Bug)

- Flaw in computer date system
- Unable to process the year 2000 therefore may revert to 1900
- Caused by low storage space and high cost for it
- Caused panic amongst a numerous amount of countries
- So what were the solutions?

# Rise and burst of the Dot-coms (1994 – 2000)

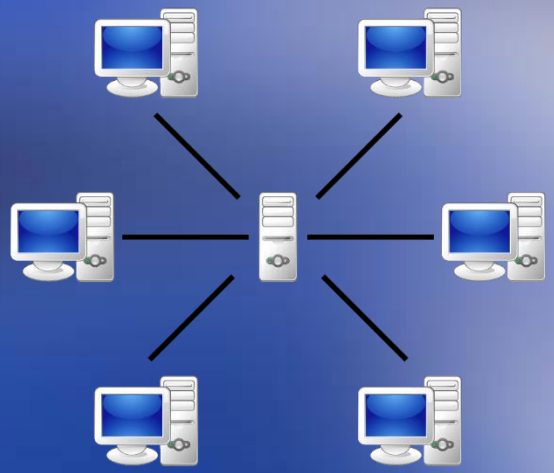
- Dot-coms companies are companies which operated online (i.e. Amazon)
- Triggered by innovation of Mosaic Web Browser and creation of HTTP
- Investors racing to invest in dot-com companies causing the bubble to rise high
- Burst at 2000

# Peer 2 Peer Network (P2P) [1999]

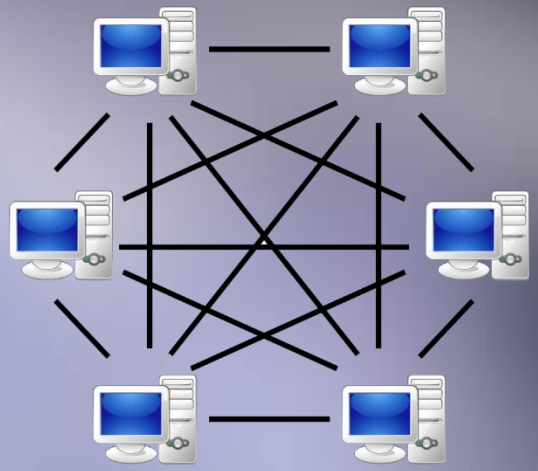
- One of the pioneers for p2p was Usenet through the use of bulletin board system and (NNTP)
- Popularized through the use of Napster in 1999
- Allowed user to transfer files without regulations
- Still widely relevant today (i.e. Torrenting)
- WoW Client update used P2P
- Windows 10 update has options for P2P updates

# P2P Continued…

- Decentralized
- Files are shared amongst each other and put together when requested from different clients
- Clients are connected to each other via a server/directory (i.e. trackers in torrenting)



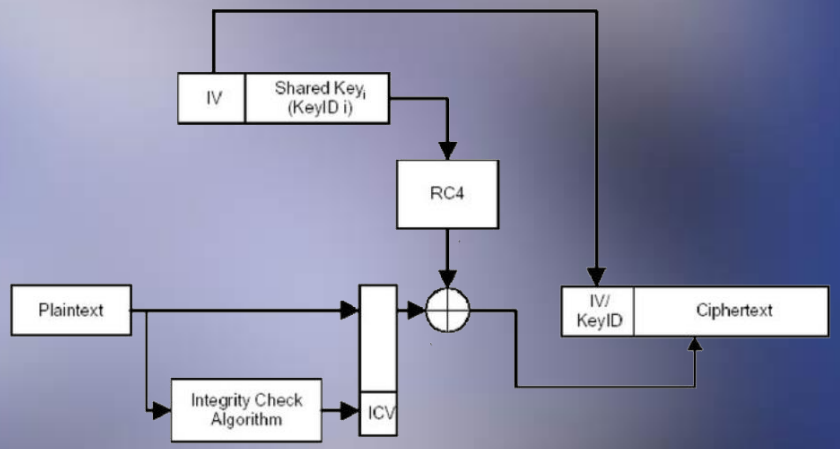
Server-based



P2P-network

# WEP [1999-2004]

- Ratified as Wi-Fi security standard in 1999
- First versions of WEP was weak (Only 64-bit encryption, later upgraded to 128-bit)
- Consisted of 40 bit key which is combined with 24-bit initialization vector
- Bad due to the use of IV (Intersecting IVs) which basically repeats the encryption once the bit runs out makes it easier to hack



# WPA [2004]

- Released by the Wi-Fi Alliance in 2004
- Uses the TKIP and Message Integrity Check system which is more secure than WEP's encryption
- Replaced my WPA2 in September 2004

# User Generated Content

- First pioneer was camera companies (KODAK) which started in 1990
- Expanded on by Fuji in 1995 by the use of digital computing
- 2000, Email clients were introduced leading people away from mail boxes
- 2005, Social media sky-rocketed with Hi5, MySpace, and later Facebook, Twitter, etc
- Today, an important part of the internet

# 3G

- Available for commercial use in 2001
- Developed by International Telecommunication Union in early 1980, specifications and standards came out 15 years later
- Tested and released by NTT DoCoMo in Japan on 1 October 2001, delayed due to concerns over reliability
- Used for wireless voice telephony, internet, video calls, streaming, etc…
- Minimal required speed: 144kbit/s

# Cloud Computing [1996]

- Mention appeared as early as 1996 in a COMPAQ (CQ) Internal Document
- First implementation by amazon.com with Elastic Compute Cloud (2006)
- Soon followed by NASA and Google in 2008
- 2010, NASA and Rackspace Hosting teamed up to create OpenStack
- Present day you have: Google Drive, Baidu Pan/Cloud, etc.

# Rise of Malicious Attacks

- Due to the expansion of WWW, many opportunities arose for spreading malicious content
- Spread of viruses, Trojans, worms, and web-based attacks
- Most prominent viruses of 2000s: Cryptolocker, ILOVEYOU, MyDoom, and many more

# 2010s

**You all know this one!**