LIS-5411

Welcome to the course!

If you can read this, you're in the right place.

Be sure NOT to leave the room tonight until the professor has indicated it is okay to do so.

The Primacy of ”Information Technology”

The Primacy of ”Information Technology”

Even-

The First Amendment?

What made the Internet unique?

(Why didn't the American Telegraph and Telephone company invent the Internet?)

Good Ol' AT&T

They had the physical network?

Which worked like the following:

Smart Network (circuit switching)

direct “single-wire” connections

Our L'il Internet

1) Pass this note to the person waving their hand.

2) If you can't, then pass it to someone

  who is closer to them. than you are.

Our L'il Internet

C D B (1/4)

Our L'il Internet

A E E (2/4)

Our L'il Internet

F A E (3/4)

Our L'il Internet

E D F (4/4)

What was sent?

A huge number

- (technically, this is DEFINITELY a right answer)

Hex: CDBAEEFAEEDF =

226,202,757,033,695

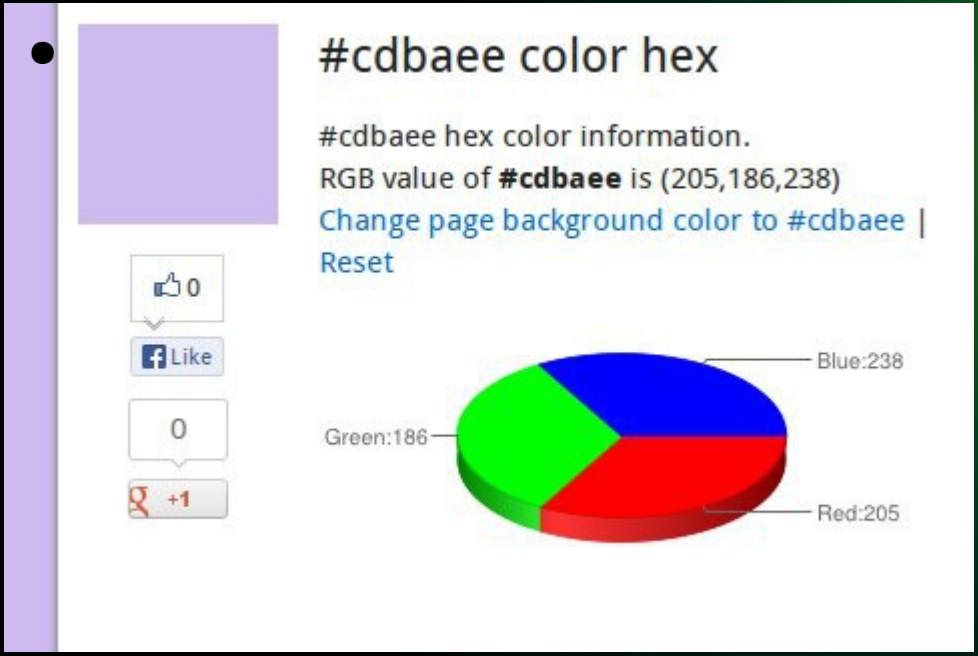
What was sent?

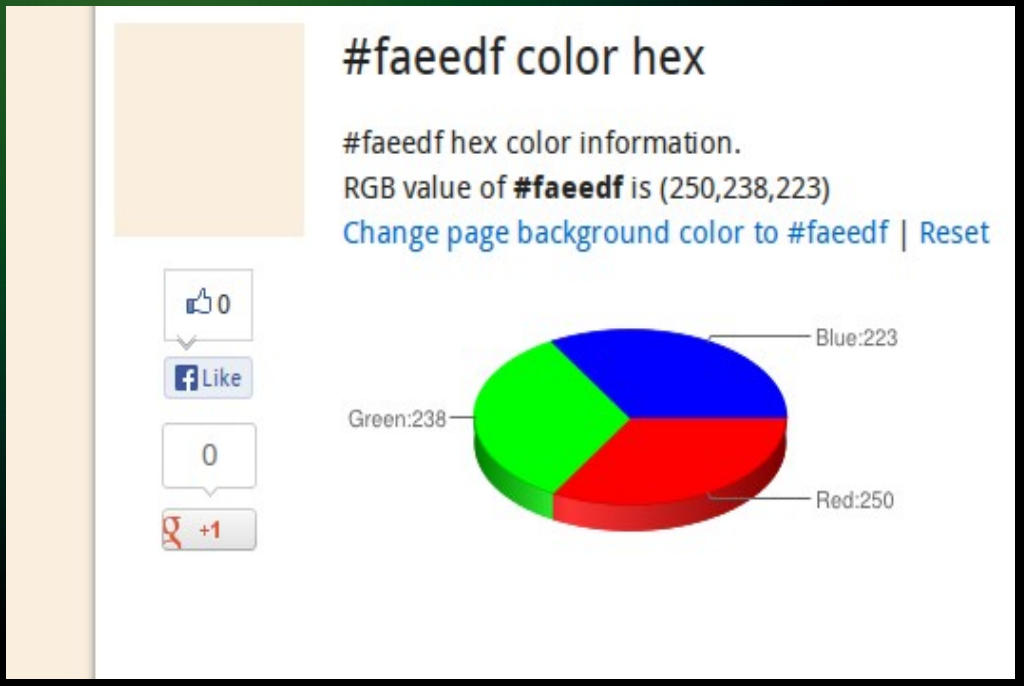
- MAC Address?
- Perhaps a computer was identifying itself.

`CD:BA:EE:FA:EE:DF`

What was sent?

Perhaps, a lovely color scheme...

- 



Smart Network (circuit switching)

direct “single-wire” connections

Top 3 things about the net:

3) DIGITIZATION

(literally, turning any “data” into a number)

this may feel like the most important part..but..

Top 3 things about the net:

3) DIGITIZATION

(literally, turning any “data” into a number)

NOTE:

The nodes need not know or care what the data “is”

(in fact, encryption can prevent them from knowing)

But: Phones (sort of) had this:

- Fax Machines (documents)
- Party Lines (group chat)
- Info Hotlines (websites)

But: Phones (sort of) had this:

:

Top 3 things about the net:

3) DIGITIZATION

(literally, turning any “data” into a number)

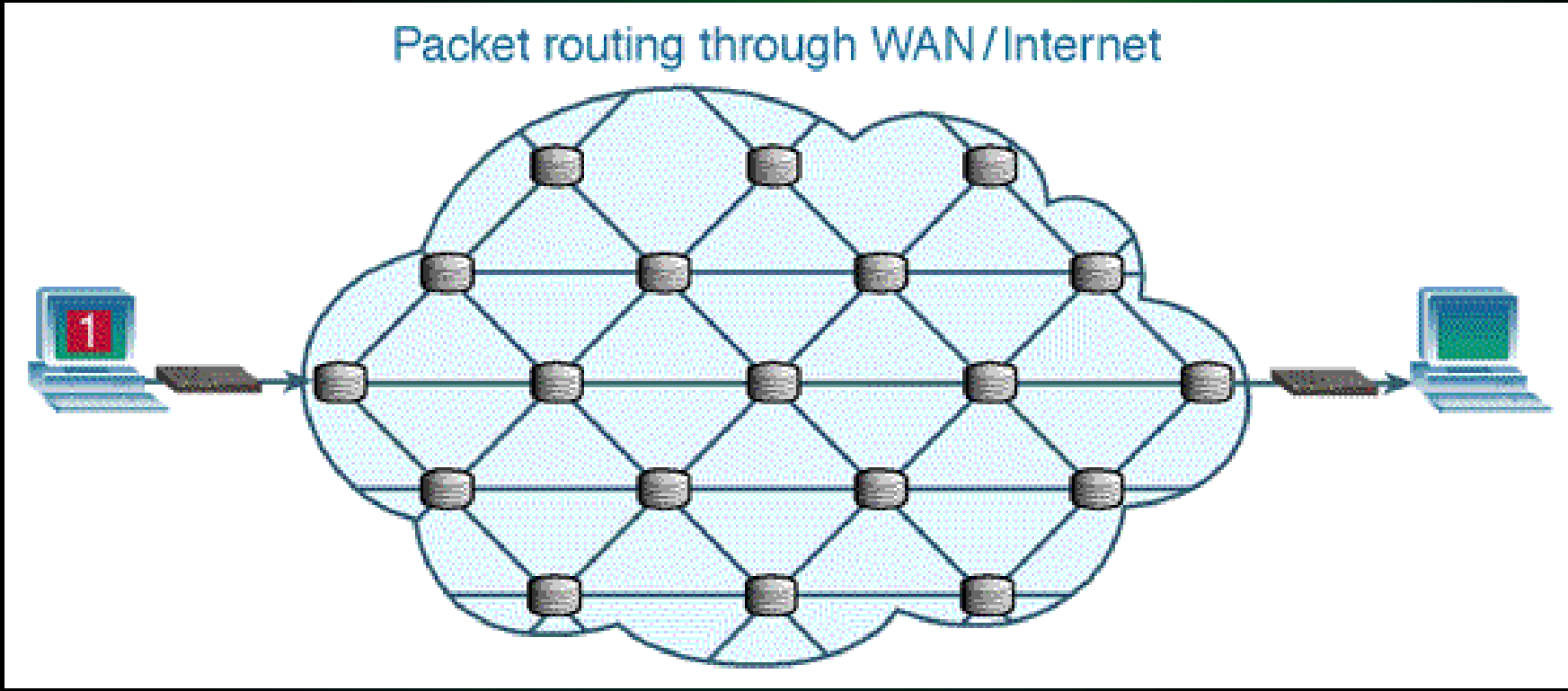
PLUS-- what else.

Not so much the “what”
but the “how”

HOW did that data move?

Dumb Network (packet switching)

indirect, node based “post-office” connections



Top 3 things about the 'net...

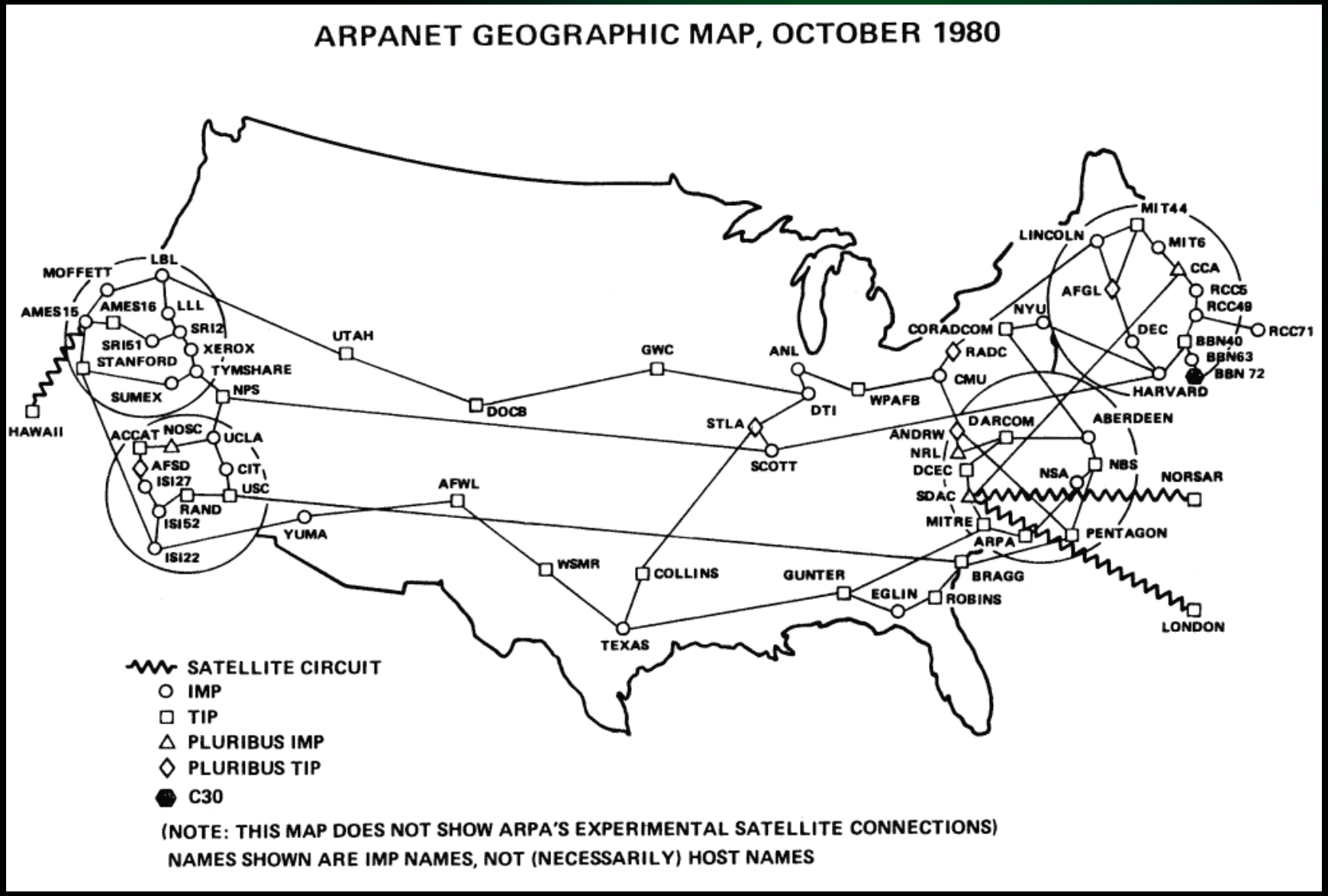
3) DIGITIZATION

(literally, turning any “data” into a number)

2) PACKET SWITCHING

as opposed to “circuit switched”

ARPANET


ARPANET GEOGRAPHIC MAP, OCTOBER 1980
LBL
MOFFETT
AMES15
AMES16
LLL
SRI2
SRI51
XEROX
STANFORD
TYMSHARE
SUMEX
NPS
HAWAII
ACCAT
NOSC
UCLA
AFSD
ISI27
CIT
USC
RAND
ISI52
ISI22
YUMA
AFWL
UTAH
DOCB
GWC
ANL
DTI
WPAFB
STLA
SCOTT
WSMR
COLLINS
TEXAS
GUNTER
EGLIN
BRAGG
ROBINS
LONDON
MIT44
LINCOLN
MIT6
CCA
AFGL
RCC5
RCC49
RCC71
NYU
CORADCOM
DEC
BBN40
BBN63
BBN 72
RADC
CMU
HARVARD
DARCOM
ABERDEEN
ANDRW
NRL
DCEC
NSA
NBS
NORSAR
SDAC
MITRE
ARPA
PENTAGON
SATELLITE CIRCUIT
IMP
TIP
PLURIBUS IMP
PLURIBUS TIP
C30
(NOTE: THIS MAP DOES NOT SHOW ARPA'S EXPERIMENTAL SATELLITE CONNECTIONS)
NAMES SHOWN ARE IMP NAMES, NOT (NECESSARILY) HOST NAMES

Top 3 things about the 'net...

3) DIGITIZATION

(literally, turning any “data” into a number)

2) PACKET SWITCHING

as opposed to “circuit switched”

1) PUBLICLY CREATED UTILITY

(not privately owned)

3 things about the 'net...

DIGITIZATION

+

PACKET SWITCHING

+

PUBLICLY CREATED UTILITY

=

Peer to peer node based network

(somewhat controversial) thoughts on innovation

The public sector (schools, defense, NASA, government) etc. is as inventive and as innovative as private companies...

..eh, probably more.

(the internet, GPS, touchscreens, digital photography, water filters, invisible braces etc.)

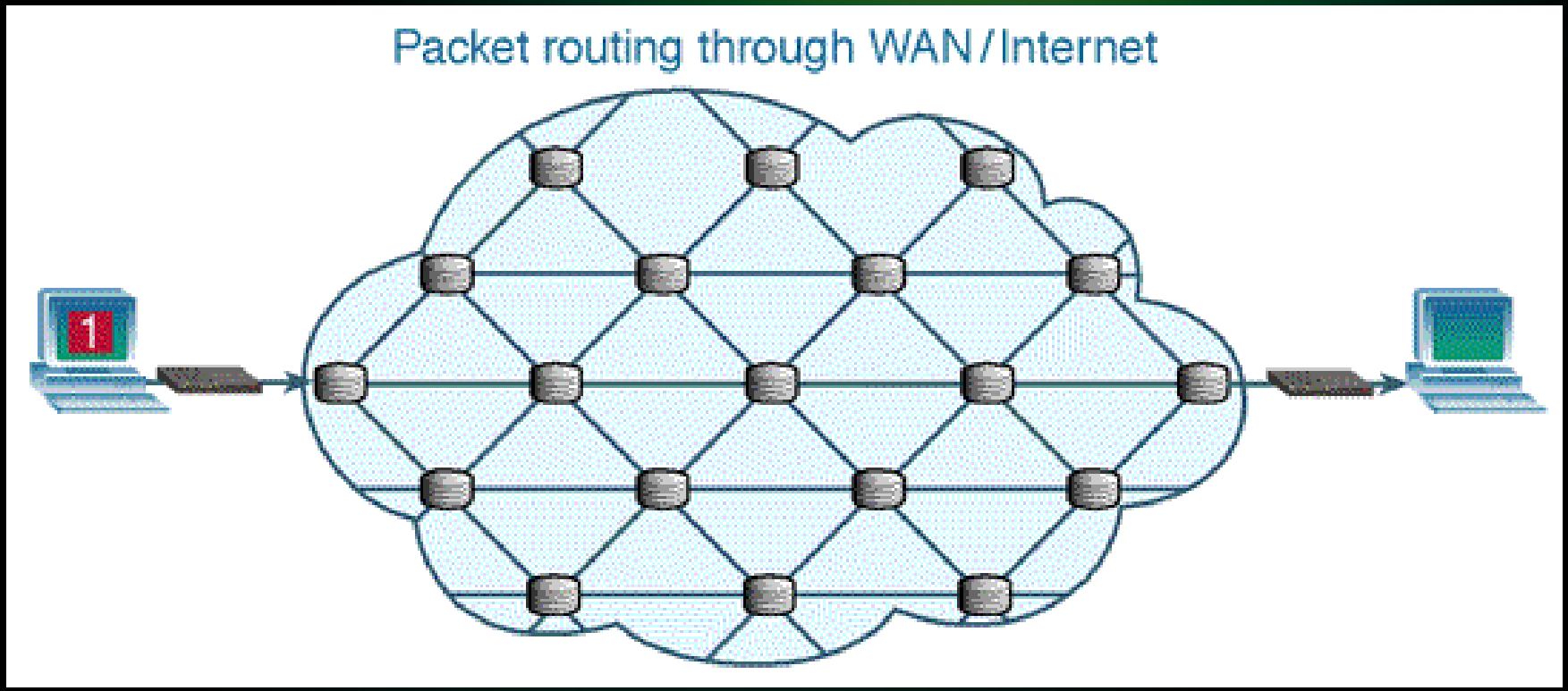
Why didn't the American Telegraph and Telephone company invent the Internet?

Nobody owns the Internet.

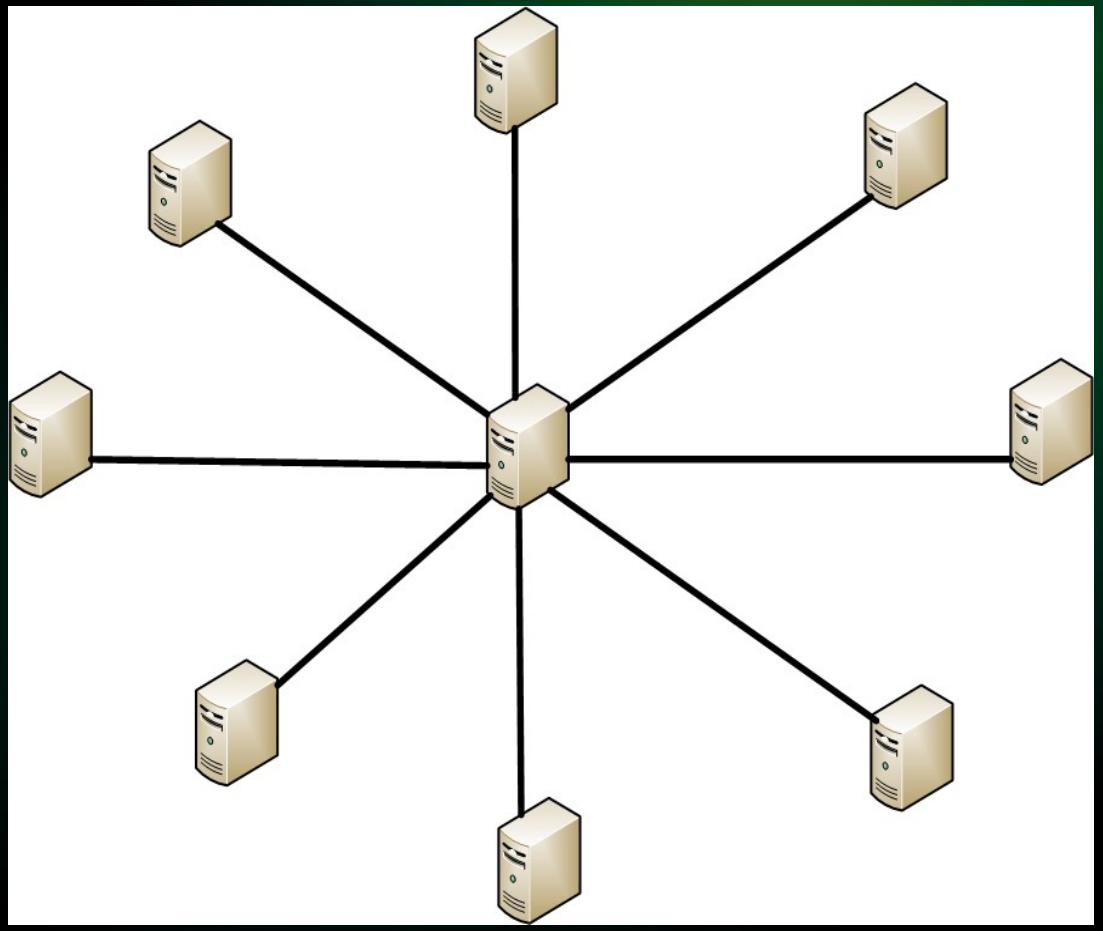
Nobody owns the Internet.

Consider: “Cable” v. “Telephones”
etc., vs.
“The Internet”

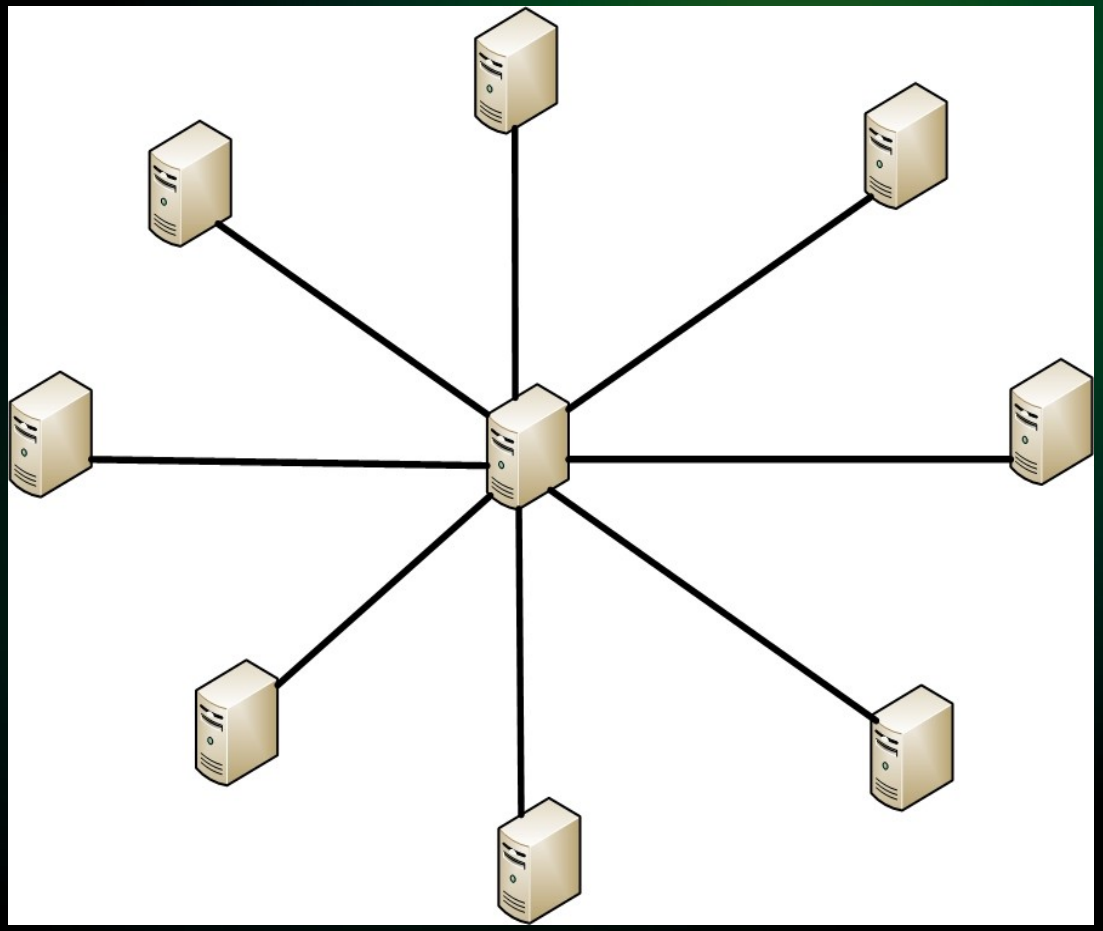
What services/protocols ACTUALLY look like this?



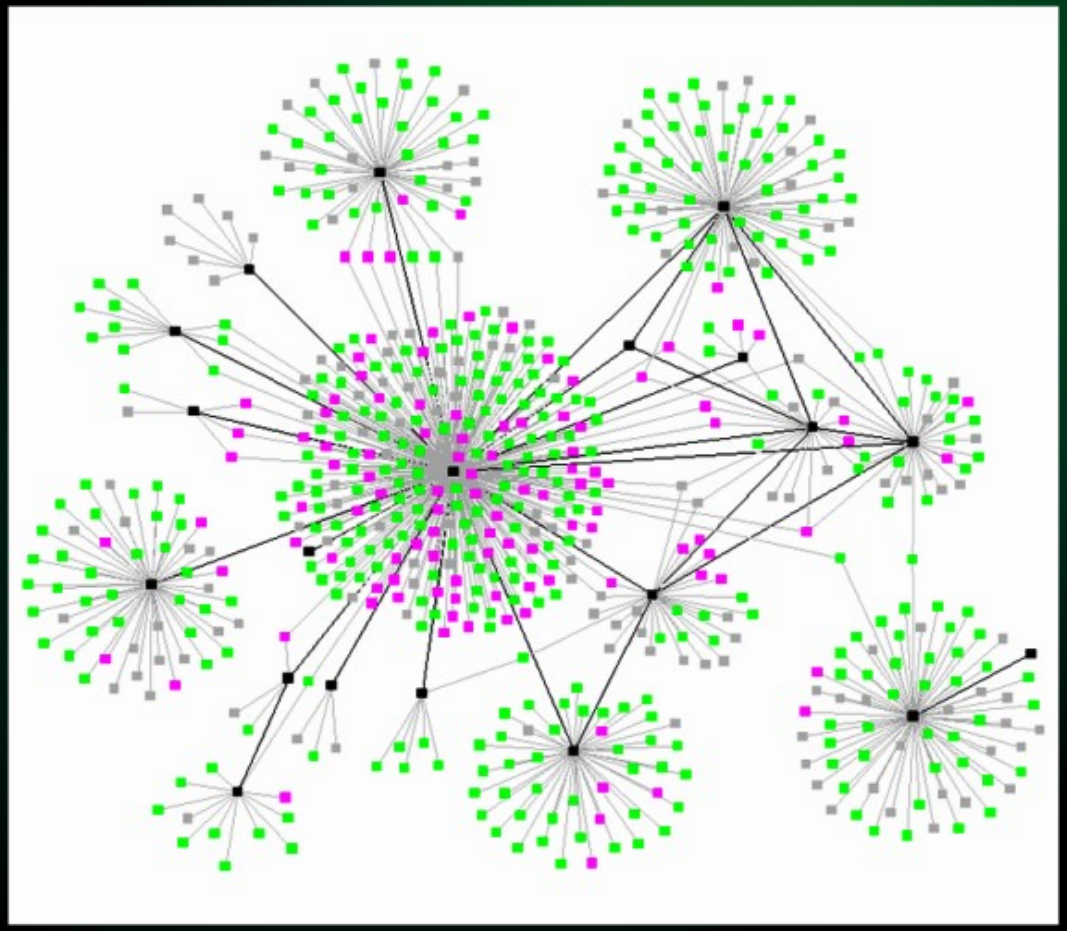
vs. this?



“Hub and Spoke”



…ish



Diversity of layers (OSI)

- Application (HTTP, telnet, etc)
- Presentation (framework MIME)
- Session (pipe,SOCKS)
- Transport (reliable packet delivery, TCP)
- Network (nodes and address, IP)
- Data (PPP)
- Physical (wires, radio, USB)