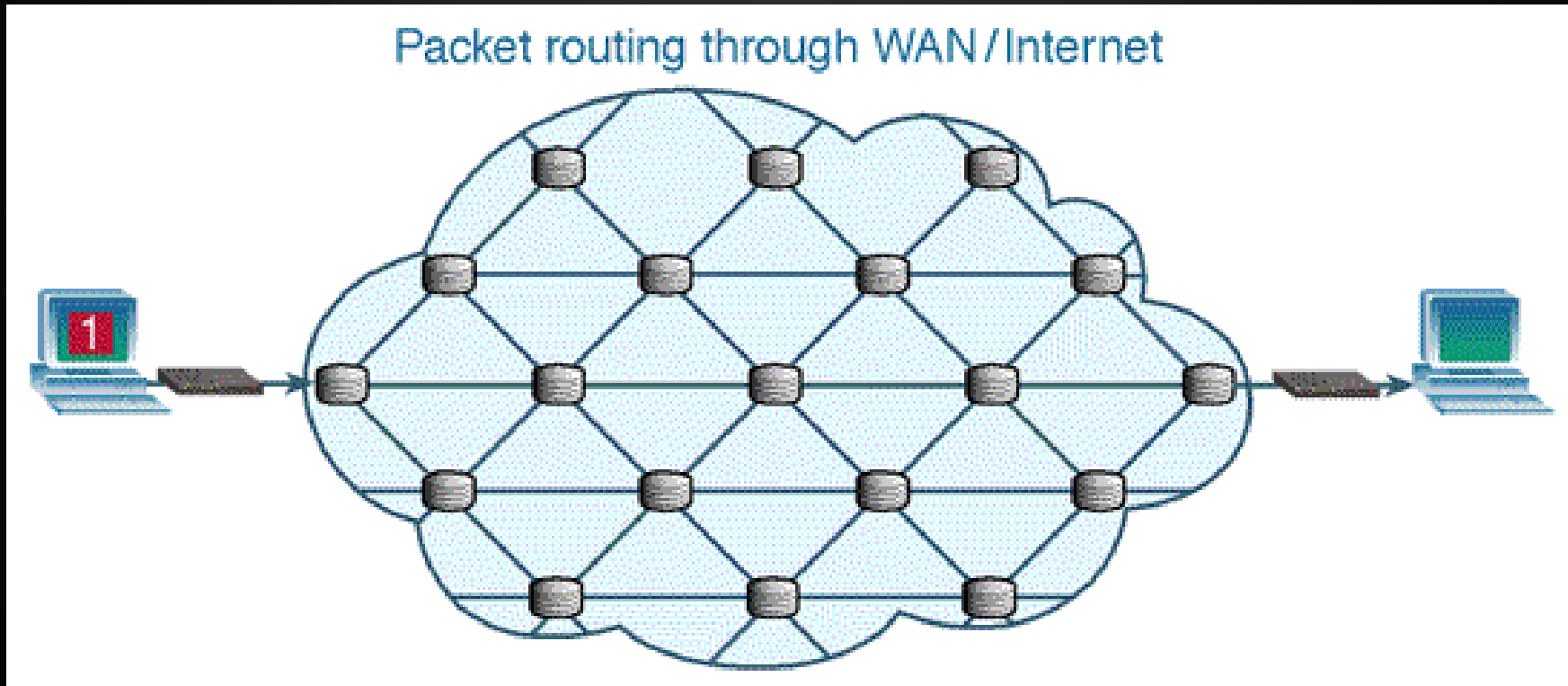


The Internet

Smart Network (circuit switching)



Dumb Network (packet switching)



Our L'il Internet

Pass this note to Ren.

If you can't, then pass it to someone
who is closer to Ren 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?

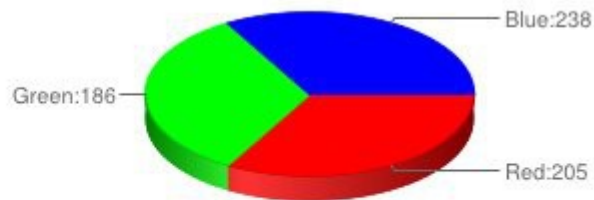
Perhaps, a lovely color scheme...

#cdbaee color hex

#cdbaee hex color information.

RGB value of **#cdbaee** is (205,186,238)

[Change page background color to #cdbaee](#) | [Reset](#)



#faeedf color hex

#faeedf hex color information.

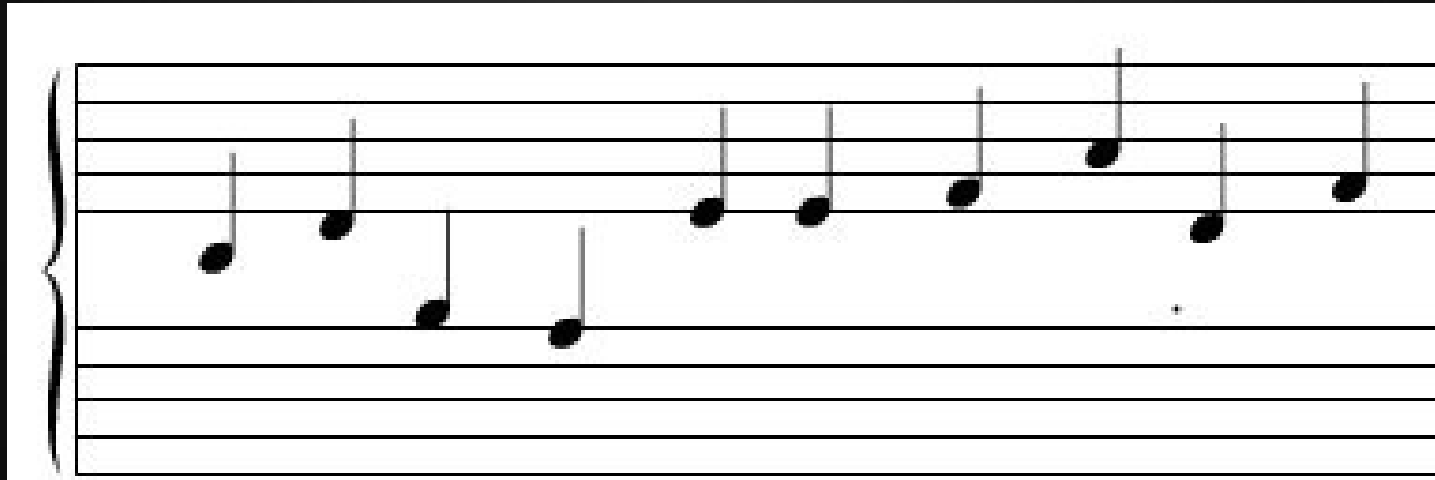
RGB value of **#faeedf** is (250,238,223)

[Change page background color to #faeedf](#) | [Reset](#)



What was sent?

Music?



What was sent?

Something else?

- 11001101101110101110111011110101110111011011111

What was sent?

Wait – maybe encrypted?

(badly)

Tricky...

C	A	F	E
D	E	A	D
B	E	E	F

Obviously, a restaurant recommendation. (Or not.)

- **CAFE DEAD BEEF**



So, we have...

•

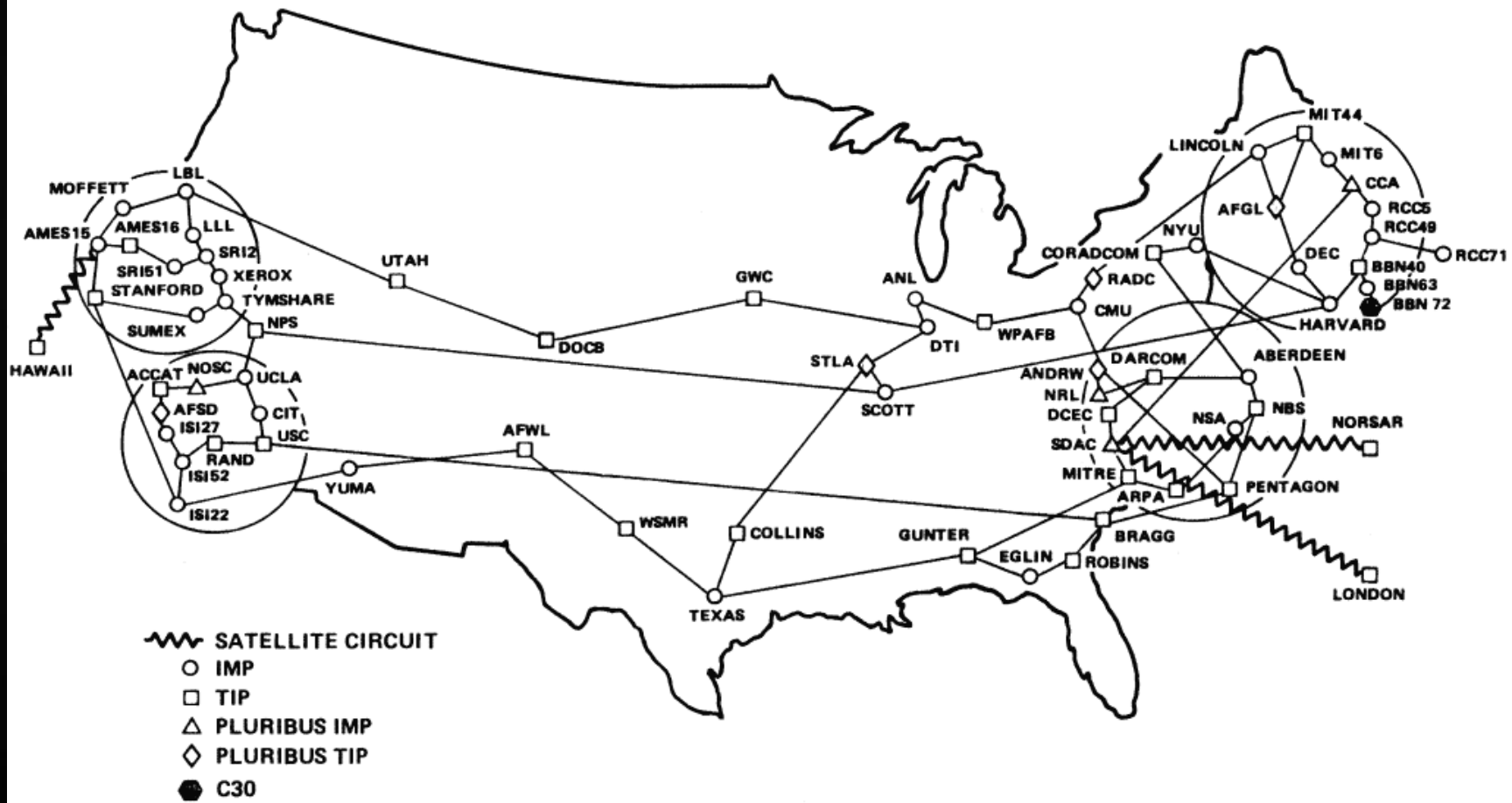
- DIGITIZATION (literally, turning any “data” into a number)

+

PACKET SWITCHING (**peer to peer** node based network)

ARPANET

ARPANET GEOGRAPHIC MAP, OCTOBER 1980



(NOTE: THIS MAP DOES NOT SHOW ARPA'S EXPERIMENTAL SATELLITE CONNECTIONS)
NAMES SHOWN ARE IMP NAMES, NOT (NECESSARILY) HOST NAMES

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



(somewhat controversial) thoughts on invention

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.)

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)

Diversity of transmission media:

- telephone lines (modem/DSL)
- - tv cable
- - wireless (802.11)
- - satellites
- - radio
- - lasers (pointless, but true)
- - fiber

Diversity of protocols

- - telnet
- - gopher
- - usenet
- - email
- - irc
- - html/www

Which is “primitive?”

```
Last login: Fri Aug 17 16:33:00 on ttys000
Valkyrie:~ whitsongordon$ sh top10.sh
Example Commands:
10. top
9. ifconfig /all
8. chmod +x newtop10.sh
7. ssh -l whitsongordon@192.168.0.12
6. wget http://lifehacker.com
5. vim todo.txt
4. grep top 10
3. ...
2.
1.

Valkyrie:~ whitsongordon$
```



Why Command Line?

Because you can very quickly say/relate complex concepts in a concise way, by combining a series of simple symbols.

You know, like talking. Or writing.

Command line is the act of literally talking to the computer....unlike...

What's so bad about the mouse again?

“Caveman interface.”

- Pre-linguistic/animal-like
- “Point and grunt”

(Tablets and even “Minority Report” are cool and fun...but why is Charades a game?)

It's so easy, even...



Intelligence requires Language

Buttons and gestures are frequently convenient for repetitive tasks...

...but to do anything intelligent, you need LANGUAGE.

TEXT. Numbers and Letters.

Why, e.g. Linux?

- 1) Free and open
- 2) Language/Text Based

(These two are completely related; newer stuff tries to allow for more of 2 and/or 1; e.g. Mac OS X, Android)

The Unix Way

Write programs that do one thing and do it well.

Write programs to work together.

Write programs to handle text streams, because that is a universal interface.

Controversial idea:

The mouse is the worst thing to ever happen to computers.

Most real work = communication = text.

- Tablets (and mouses) arguably didn't do much for productivity...
- Siri, et al, on the other hand...

LEVELS of complexity

(all computer languages are for humans!)

Changing your screensaver

Writer/Word

Calc/Excel

HTML/CSS

Bash

PHP/MYSQL/Javascript

Python/Perl/Ruby *interpreted/scripted*

C *compiled*

Assembly (00 4E A3 77 8C 0A etc)

Machine (00101010011010101100)

Two Kinds of Files.

TEXT and BINARY. That's all, really.

(open it in a text program like gedit or leafpad or notepad. Can you kind of read any of it?)

NOTE: Remember, frequently you can convert one to the other, e.g. ZIPs

TEXT, .e.g.

Text

- HTML
- XML
- .ini

BINARY, e.g.

- Executables (bin, exe)
- ZIP
- ISO

More on TEXT

```
munif@ubuntu: ~  
~  
~ customizable to suit your workflow. It supports macros  
~  
~ VIM - Vi IMProved  
~  
~ version 7.4.1689  
~ by Bram Moolenaar et al.  
~ Modified by pkg-vim-maintainers@lists.ubuntu.com  
~ or Alternatives. Vim is open source and freely distributable  
~  
~ Help poor children in Uganda!  
~ type :help iccf<Enter> for information  
~ as is that it can be transformed into something  
~ type :q<Enter> to exit  
~ text editor. The type :help<Enter> or <F1> for on-line help  
~ type :help version7<Enter> for version info  
~ tion for using in completely different settings like  
~  
~ Running in Vi compatible mode  
~ rd processor type :set nocp<Enter> same for Vim defaults  
~ type :help cp-default<Enter> for info on this  
~  
~  
~
```

More on “Text”

- The “lingua franca” of computers – you dig deep enough, this is where you get.
- formerly ASCII, now “Unicode” (EMOJI!!)
- Most often “monospaced” (ugly, but with advantages)
- Where sane languages live

More on “Text”

Ideally – this is the best place to pick up / play with programming concepts...

...too bad we sort of won't. :)

HTML



...but I'm not a language

HTML

HyperText Markup Language

Technically, just a way to decorate text.

...and later, obviously, a framework for much much more....

HTML

Interesting alternatives to HTML: (on either side...)

Markdown

LaTeX