LIS-5362

Multimedia Concepts

Remember:

- We're presuming that:
- – the **local** computer is fast
- and

    – File storage is costly

- – the network is slow

    => thus, small filesizes are better.

File Compression (ZIP)

- Lossless (or "Perfect") file compression.

  To make smaller, so as to be able to store more, or send faster.

  But also, to reproduce PERFECTLY.

  (it's not magic)

Consider:

- *"Penelope and Robert Jones Smith went to the car and grabbed the bat and the ball and the chair and the Doritos and Penelope's coat and Robert Jones Smith's favorite suit and the directions to the park. Penelope told Robert Jones Smith that they and the other people were going to have a wonderful and fun and lovely day. Robert Jones Smith told Penelope that he agreed. Also, that her name started with P."*

First step:

- Turn all the ands into &.

- &->and

- *Penelope & Robert Jones Smith went to the car & grabbed the bat & the ball & the chair & the Doritos & Penelope's coat & Robert Jones Smith's favorite suit & the directions to the park. Penelope told Robert Jones Smith that they & the other people were going to have a wonderful & fun & lovely day. Robert Jones Smith told Penelope that he agreed. Also, that her name started with P.*

But this doesn't have to read like English...

- &->and

- #->the
Penelope & Robert Jones Smith went to # car & grabbed # bat & # ball & # chair & # Doritos & Penelope's coat & Robert Jones Smith's favorite suit & # directions to # park. Penelope told Robert Jones Smith that #y & # o#r people were going to have a wonderful & fun & lovely day. Robert Jones Smith told Penelope that he agreed. Also, that her name started with P.

Robert has a long name...

- &->and

- #->the

- RJS->Robert Jones Smith

- *Penelope & RJS went to # car & grabbed # bat & # ball & # chair & # Doritos & Penelope's coat & RJS's favorite suit & # directions to # park. Penelope told RJS that #y & # o#r people were going to have a wonderful & fun & lovely day. RJS told Penelope that he agreed. Also, that her name started with P.*

Penelope too, but wait...

- "Also, that her name started with P"

  →

  "Also, that her name started with Penelope"

So, then...

- &-›and

- #-›the

- RJS-›Robert Jones Smith

- PP-›P

- P-›Penelope (UNLESS ITS PP)

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- P & RJS went to # car & grabbed # bat & # ball & # chair & # Doritos & P's coat & RJS's favorite suit & # directions to # park. P told RJS that #y & # o#r people were going to have a wonderful & fun & lovely day. RJS told P that he agreed. Also, that her name started with PP.

But what if the next file is?

- P P P P

-

- →

PP PP PP PP

The file gets BIGGER.
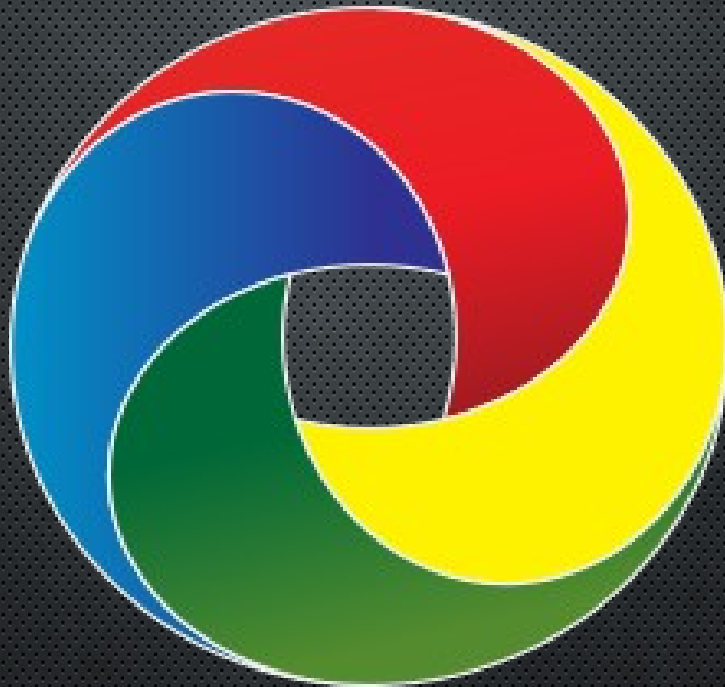
Pictures on the web:
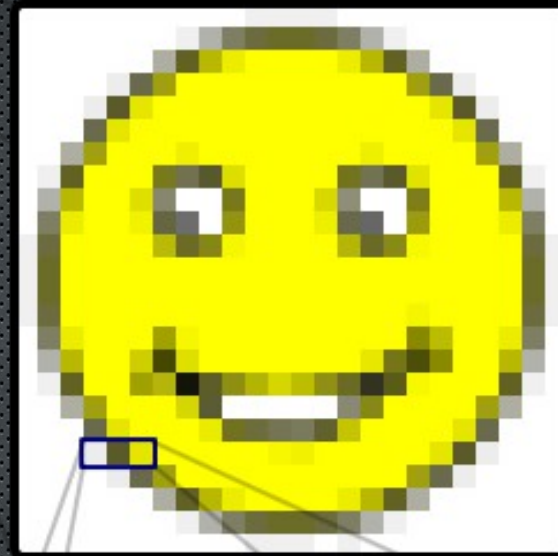
- Basically, two formats:

  Raster and Vector.

  Most of the time you're looking at RASTER, which is basically a grid.

Vector Graphics

- Use math (specifically, geometry) to tell the computer how to draw the lines and do the colors – then render it somehow

Lossless (RAW) Raster

R 93%	R 35%	R 90%
G 93%	G 35%	G 90%
B 93%	B 16%	B 0%

Lossless image compression

- Instead of
  "0,0 = white   0,5 = white

- 0,1 = white   0,6 = white

- 0,2 = white   0,7 = white

- 0,3 = white   0,8 = white

- 0,4 = white   0,9 = white"...

Just say..

0,0 through 0, 10 = white.

This also works for audio...

1 sec. = silence

2 sec. = silence

3 sec. = silence....etc

just say

1-10 sec. = silence

..and video

"at 0,0 for 10 seconds = white"

Lossy Compression

- As implied, you LOSE some of the original data, by design.

"Goldilocks and the 3 bears" (with lossy compression)

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- Some nosey girl went up in some bears' house, ate their food, fell asleep and freaked out when the bears came back.

Lossy compression =
Good for analogue/multimedia

Tiny filesizes; takes advantage of the limitations in human perception.

We cannot percieve individual pixels (or samples) when surrounded by other meaningful pixels/samples. They blur, frequently in predictable patterns.

- "if 0,0 is white, 0,1 is likely to be white, or light gray"

  "if 0,1 is light gray, 0,2 is likely to be slightly darker gray..."

- What happens if you compress something losslessly over and over?

  What happens if you compress something lossi-ly over and over?

Images

RAW/LOSSLESS: GIF, PNG, RAW, TIFF, BMP

LOSSY: JPG, "webm"

VECTOR (lossless by definition) : SVG

AUDIO

RAW: WAV

LOSSLESS: FLAC

LOSSY: MP3, Ogg Vorbis

(then there's MIDI, which is basically "sheet music.")

A bit of mythbusting...

- 192kb mp3 is probably fine
- Humans DEFINITELY can't distinguish beyond 320k
- Don't get me started on vinyl fetishists..

(Yeah, I still rip my CD's to FLAC anyway..)

(But at least I don't buy monster cables)

Video:

RAW/LOSSLESS: You're pretty much never gonna see it.

LOSSY: MPG, AVI, DIVX, webm, Ogg Theora.

(hint, the "OGGs" are the only "completely open" ones)

Flash?

Ugh.

So, flash can be a "container" for all of these.
Good example of "feature creep."

Argument: HTML5 was literally designed to
eliminate Flash/Shockwave