CANVAS

The Application Protocol

My protocol, **C**oloring **AN**d **V**iewing **A**rt **S**quares, provides a simple means of changing the "pixels" of a single common "image." In reality the image is an array of text and its pixels are Full Block (`U+2588`) characters. Message passing is handled by UDP over POSIX sockets. Clients send instructions to the server, and in response the server modifies or erases a pixel in the image. Clients can also request the current state of the image, as well as a sample image.

The idea of having an indefinite number of clients modify an image simultaneously was partially inspired by the Reddit's April Fools Day gag for 2017, /r/place.

(https://redditblog.com/2017/04/18/place-part-two)

Running Client and Server

First ensure that the executables are ready to run by compiling/cleaning with `make`.

To run the server, simply invoke `./proj4d port`, where `port` is the port number that is available for you to use on your system.

To run a client, simply invoke `./proj4 host port`, where `host` is the host name of the server you wish to reach (e.g. `localhost`, `eecslab-5.case.edu`) and `port` is the port number that the server is expecting connections on.

Protocol Commands

Note: All commands are case-sensitive. In general all capitals should be used.

MARK Marks (colors or recolors) a certain pixel in the image.

> Format: MARK X Y COLOR
> Parameters:
>
> | | |
> |---|---|
> | X | the x-coordinate of the pixel |
> | Y | the y-coordinate of the pixel |
> | COLOR | the color that replaces the pixel's current color |
> | | [RED \| GRN \| YEL \| BLU \| MAG \| CYN \| WHT] |

ERAS Erases a certain pixel in the image.

> Format: ERAS X Y
> Parameters:
>
> | | |
> |---|---|
> | X | the x-coordinate of the pixel |
> | Y | the y-coordinate of the pixel |

PRNT Prints the current image.

> Format: PRNT
> Parameters:
>
> none

TEST Prints a sample image for testing display compatibility.

> Format: TEST
> Parameters:

TIME Prints the current server time.

Format: TIME
Parameters:

Justifications

UDP was selected for use instead of TCP due to the nature of the application compared with UDP's strengths. CANVAS does not require a persistent connection, messages are short and the data transfer is minimal. Additionally, the server does not need to retain information about clients after it gives a response.

How Things Should Look

The sample image, requested with TEST, on the programmer's machine and on eecslab-5.