Project Volta

Improving file transfer speeds onto different devices

The problem

The normal transfer of files can take up a lot of time

- Normally single threaded
- Under utilizing the resources

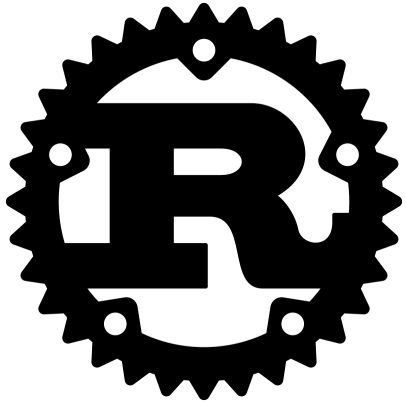
Related Work & Their Problems

- Robocopy
  - Windows only
  - Not a lot of people use it because it has no UI
  - Hasn’t been updated in over 5 years
- Teracopy
  - Windows only
  - Lack of kernel integration

Technologies

Rust
- Safe and blazingly fast
- If it compiles it will run

Tauri
- An alternative electron
- Lightweight and secure by default



Approaches

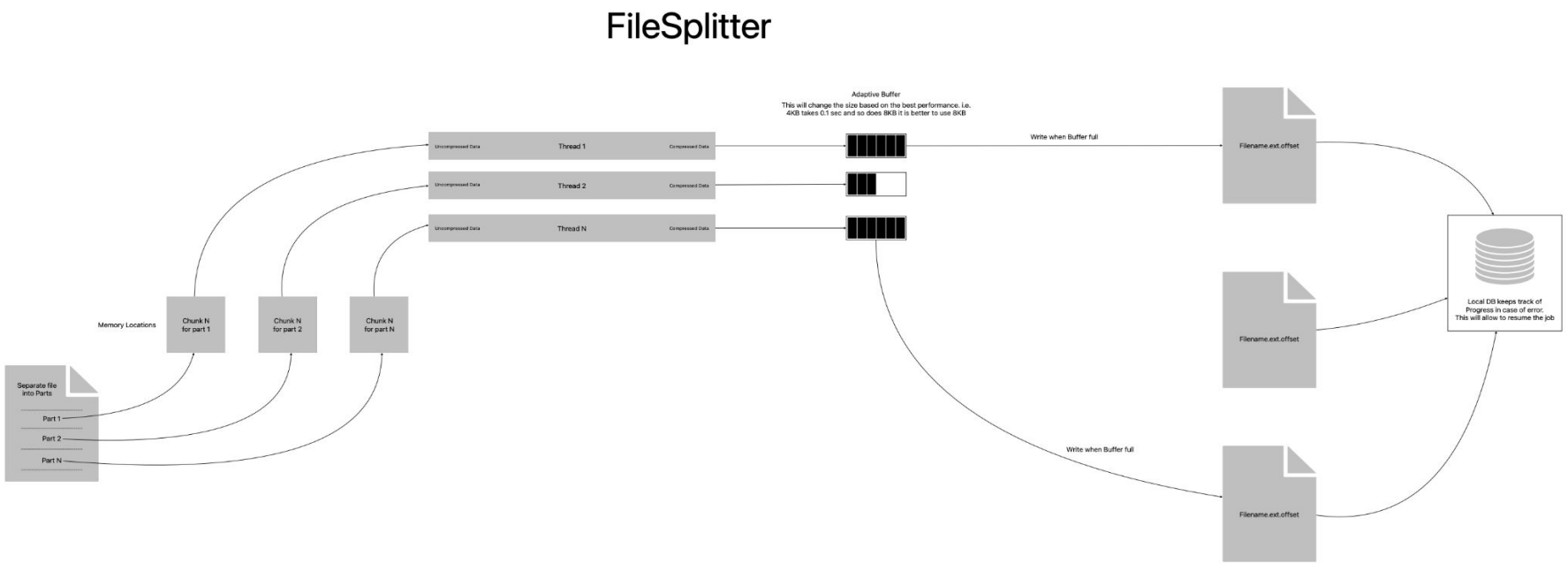
People normally carry flash drive two main reasons:

1. Transfer files between computers
2. Storing files as backup

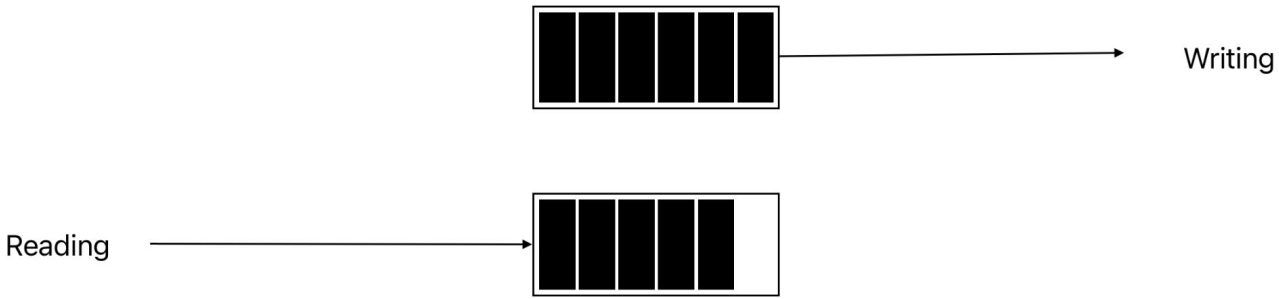
Neither of these case require the file in its original format

1. Using in async I/O to speed up the process
2. Using compression to reduce the overall file size
    a. This is an implementation of smarter compression
3. Parallely operating multiple file
4. Somehow allow for multiple logical cursors

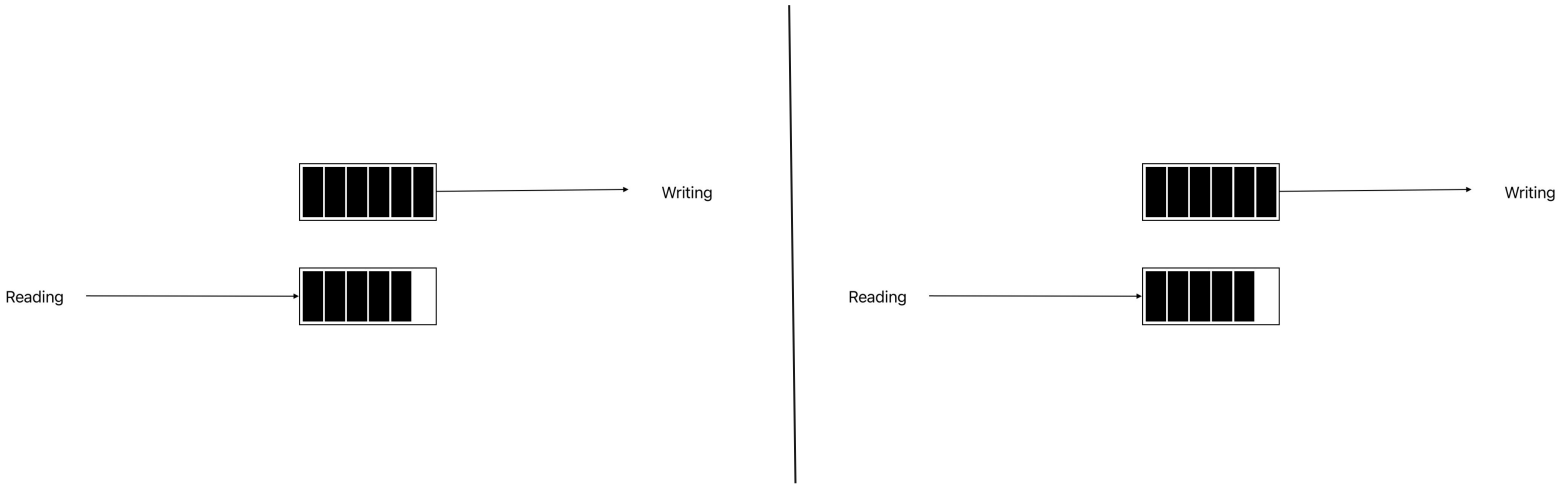
“Innovative Idea”



New Idea



New Idea



Issues

1. Context Switching too often - very expensive process
2. Constantly competing for resources
    a. CPU spent more time fighting for resources and than actually working
3. Compression is slower than anticipated. Comparing to a simple copy/ paste function, compression took 25% more time. On the bright side, the compression, decreased the size of file significantly
4. Tauri is not mature enough. There are limitation on the state manager which causes problems with UI.

Things to know for Future Work

1. Better Design
2. Wisely choosing the input variables and numbers. Noticed a performance boost when the number of threads were fewer.
3. Explore better compression algorithms such as 7z.
4. Adaptive Buffered Writer - internal buffer size changes on demand observation

Questions?

Thank You

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