Browsix: Bringing Unix to the Browser

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Today

Abstract

While standard operating systems like Unix make it relatively simple to build complex applications, web browsers lack the features that make this possible. In this paper, we present Browsix, a JavaScript-only framework that brings the essence of Unix to the browser. Browsix makes core Unix features available to web applications (including pipes, processes, signals, sockets, and a shared file system) and extends JavaScript runtimes for C, C++, Go, and Node.js programs so they can run in a Unix-like environment within the browser. We illustrate Browsix's capabilities by converting a client-server application to run entirely in the browser and developing a serverless LaTeX editor that executes PDFLaTeX and BibTeX in the browser.

1 Related Work

Browsix builds on and extends its filesystem component, BrowserFS. Emscripten compiles LLVM bytecode to JavaScript, enabling the compilation of C and C++ to JavaScript [2]. Browsix augments its runtime system so that unmodified C and C++ programs compiled with Emscripten can take full advantage of its facilities. GopherJS compiles Go code to JavaScript and provides similar runtime support [1].

References

[1] Richard Musiol. *gopherjs/gopherjs: A compiler from Go to JavaScript for running Go code in a browser*, 2016. `https://github.com/gopherjs/gopherjs`.

[2] Alon Zakai. Emscripten: an LLVM-to-JavaScript compiler. In *OOPSLA Companion*, pages 301–312, 2011.