Safe WebSocket Communication on JavaScript via FreeST

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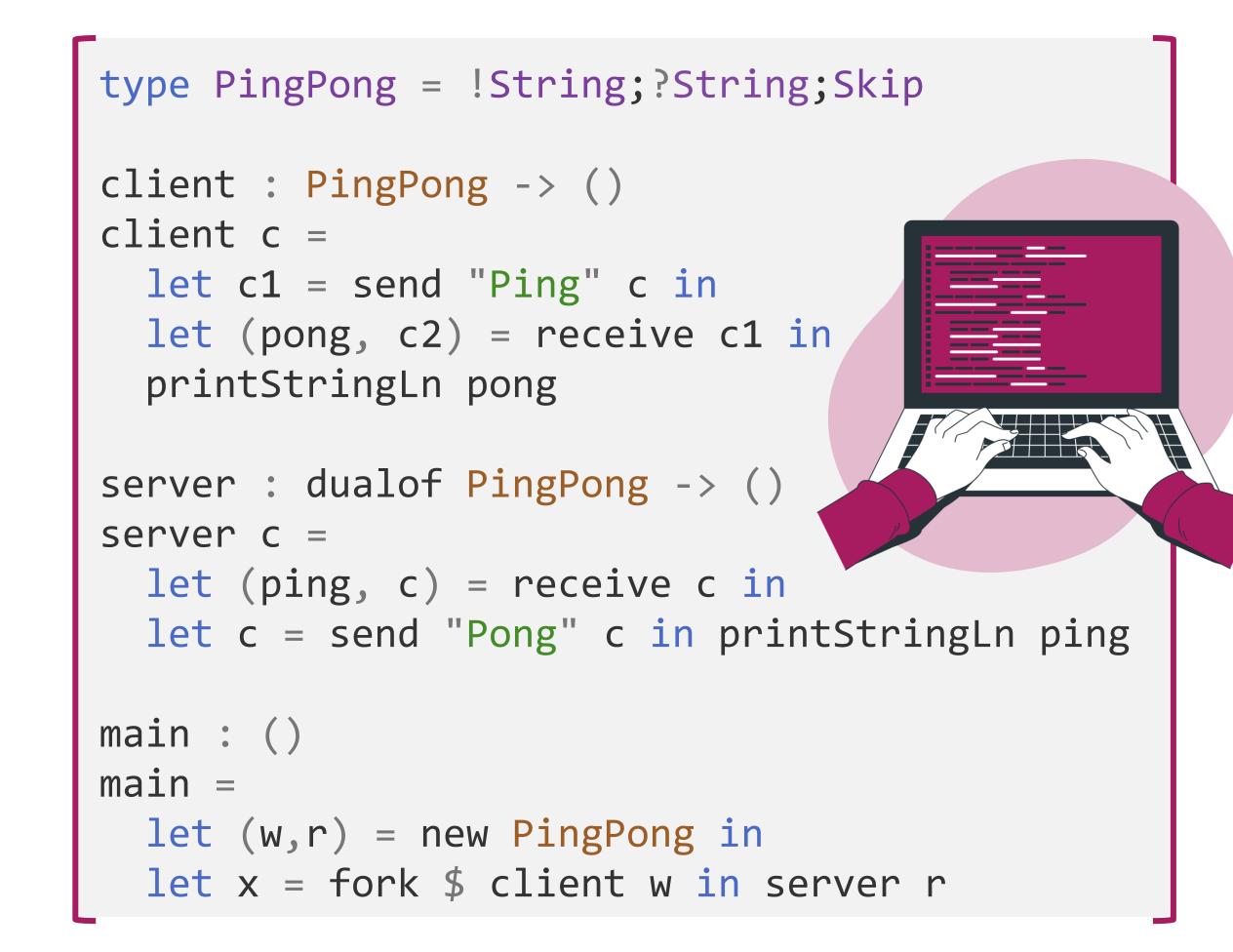
Motivation

Web applications have become very popular in the past years. Activities like booking flights and hotels, banking transactions, ordering food, and many others are done online. These tasks commonly occur through interactions between a client hosted on a browser and a server running on a machine somewhere in the world. For everything to work correctly, both sides need to be synchronized and follow a specified protocol.

TypeScript is a superset of JavaScript with additional types. It makes a good choice as a target language since the type system allows easier debugging during compiler development.

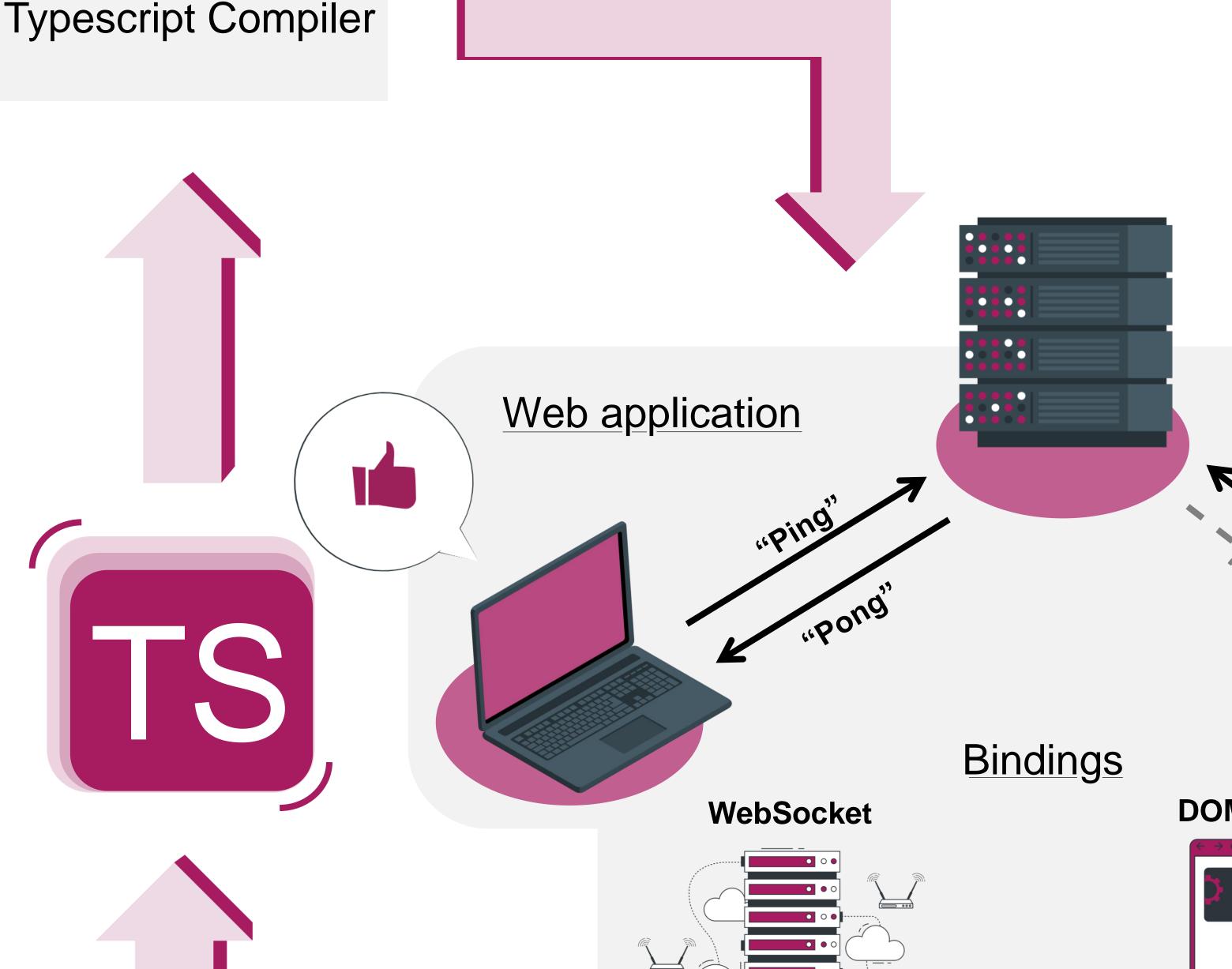


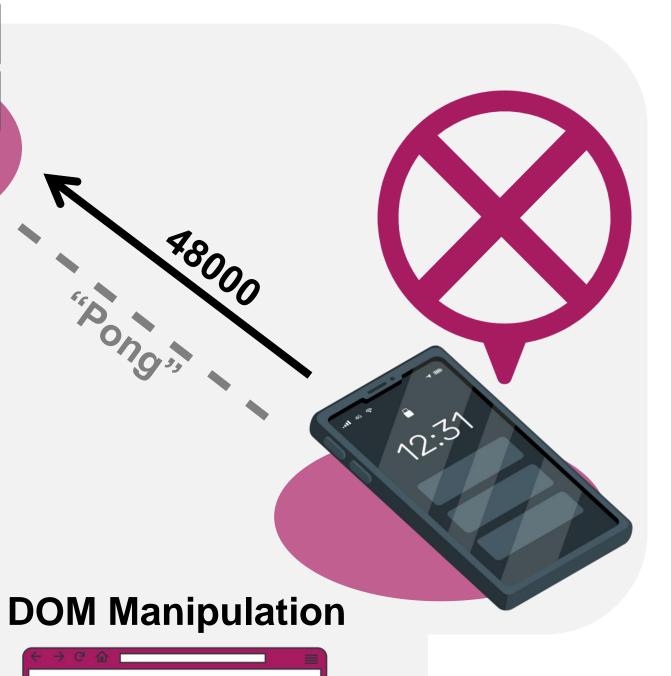
Information is sent

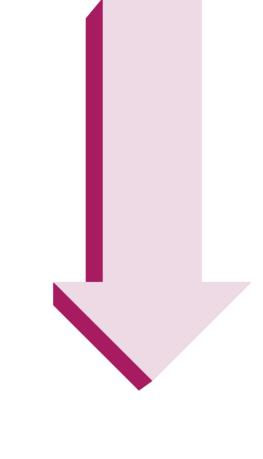


FreeST

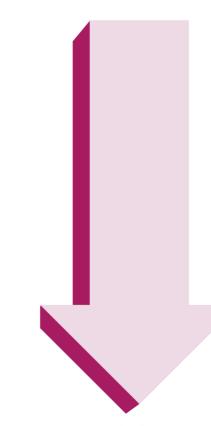
FreeST is a functional language that implements expressive session types. This language allows developers to write typed protocols, ensuring that communication between two nodes is correct. We propose a JavaScript compiler for FreeST, allowing the use of session types to write more reliable web applications







Compiler Frontend







Compiler Backend

To code an application in FreeST, the language needs to present a library of functions that will translate into JavaScript. Modules were added to compartmentalize FFI and bindings, which will allow for communication through WebSocket and manipulation of the DOM.



Type Checker



