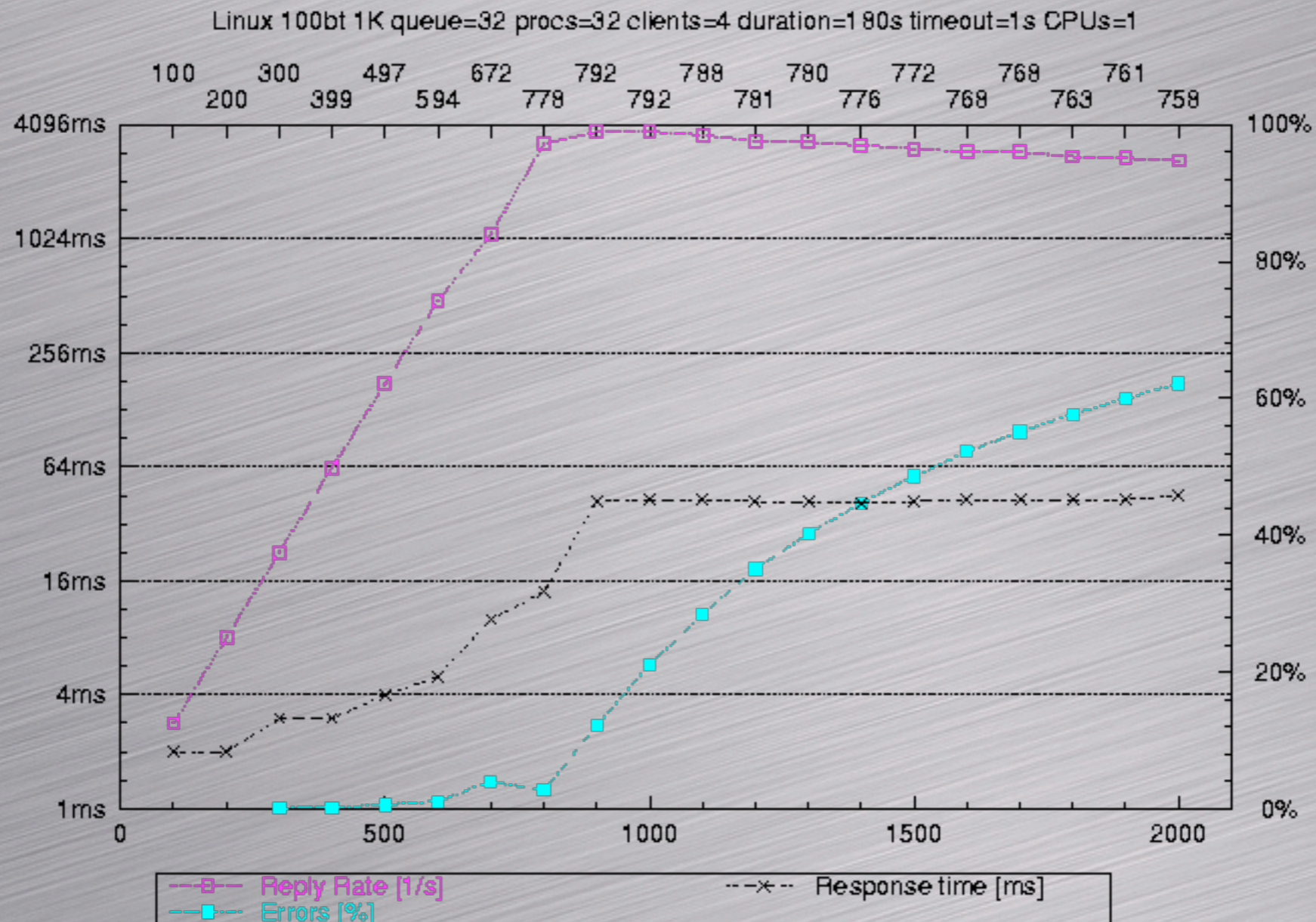


Threading by Appointment

Christoph Kirsch
University of Salzburg

Benchmarks!



[httpperf benchmarks]

The C10k Problem

- C10k: servers should be able to handle **>10000** clients/sec
- Given **20000** clients and a **1GHz** CPU with **2GB** RAM & **1GBit/sec** Ethernet
- We have **50KHz/client**, **100KB/client**, and **50KBit/sec/client**
- Is this enough to grab **4KB** from disk and send it to the network **once a second** for each of the **20000** clients?

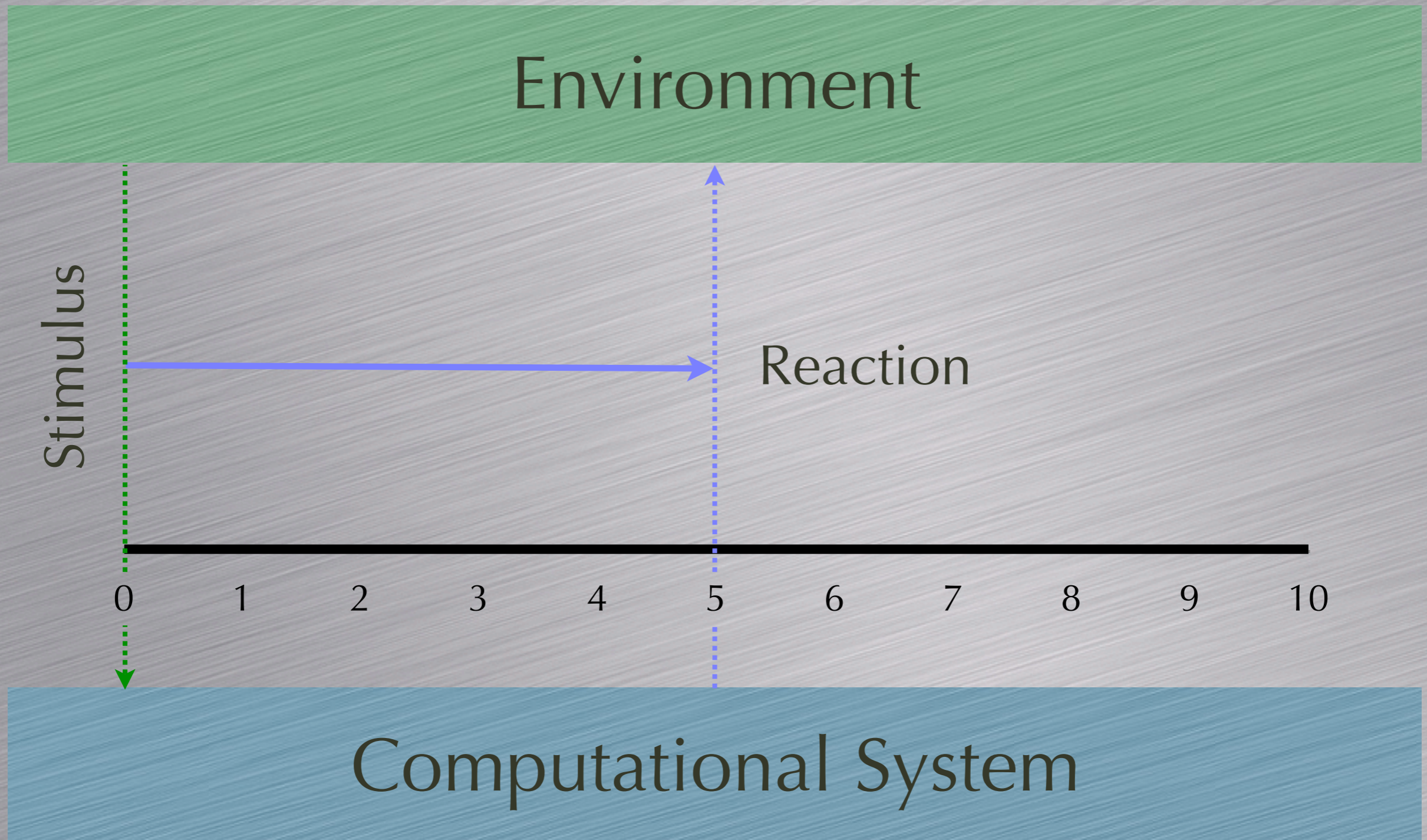
Potential Applications

- Transaction-oriented applications
- Web and file servers
- Databases
- GUIs

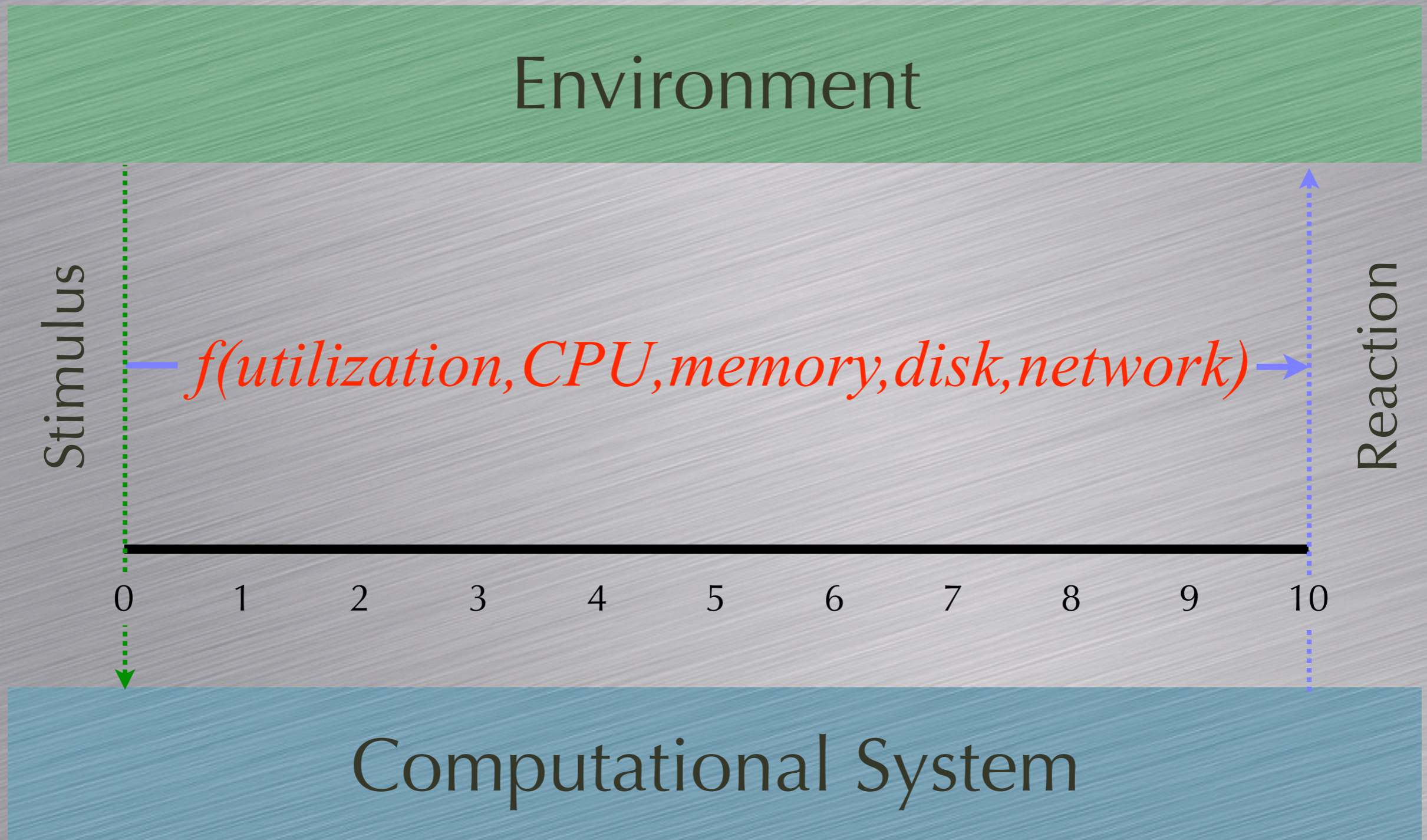
Long-Term Goals

- **Compositional** models for concurrent programming
- **Verifiable** implementations of concurrent programs
- **Predictable** performance even in overload scenarios

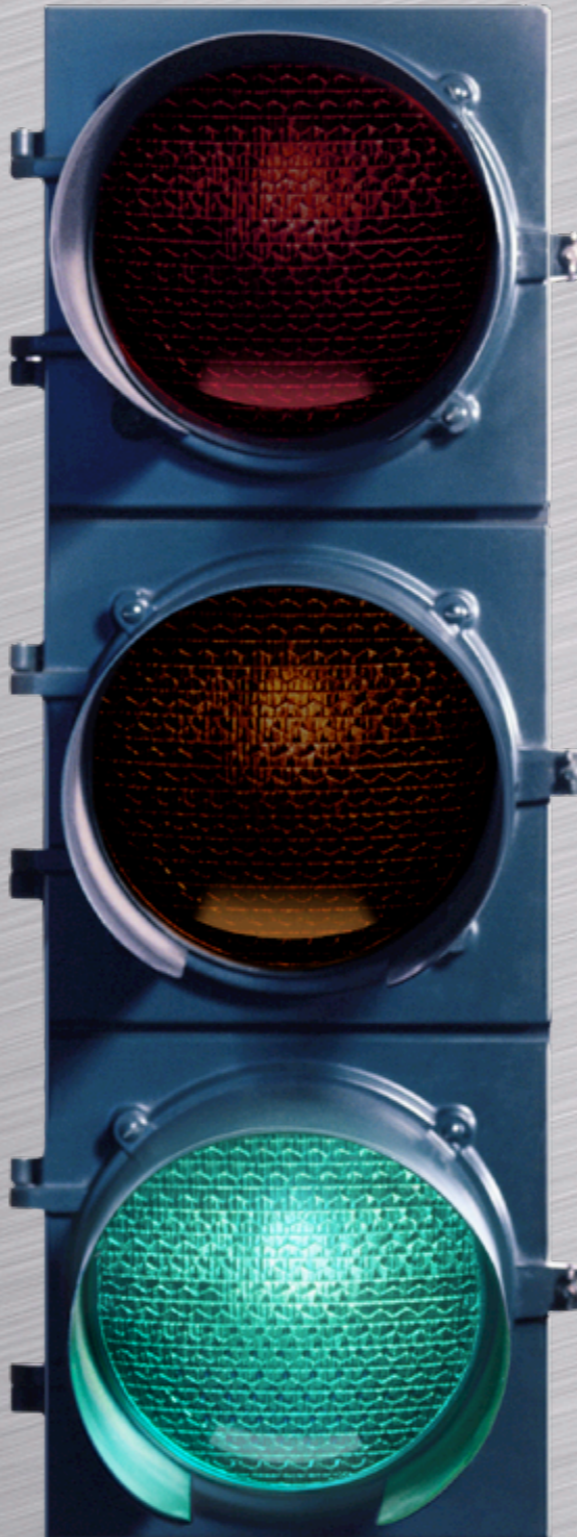
The I/O Problem



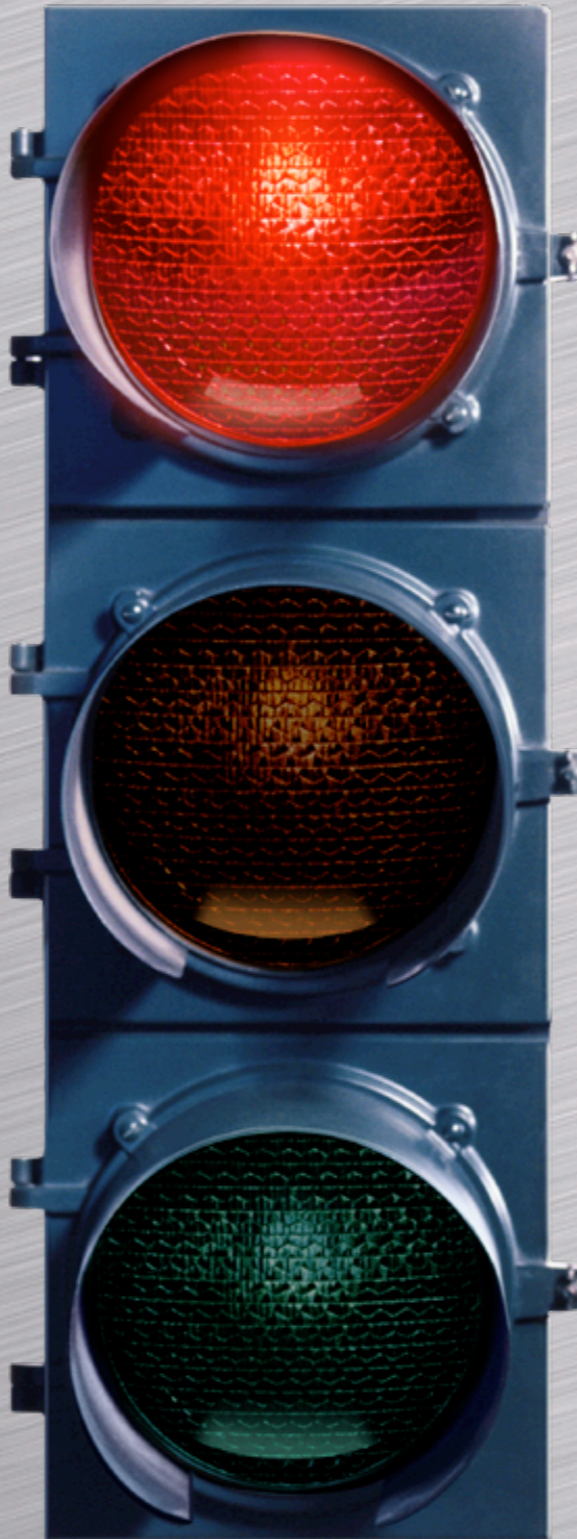
State-of-the-Art



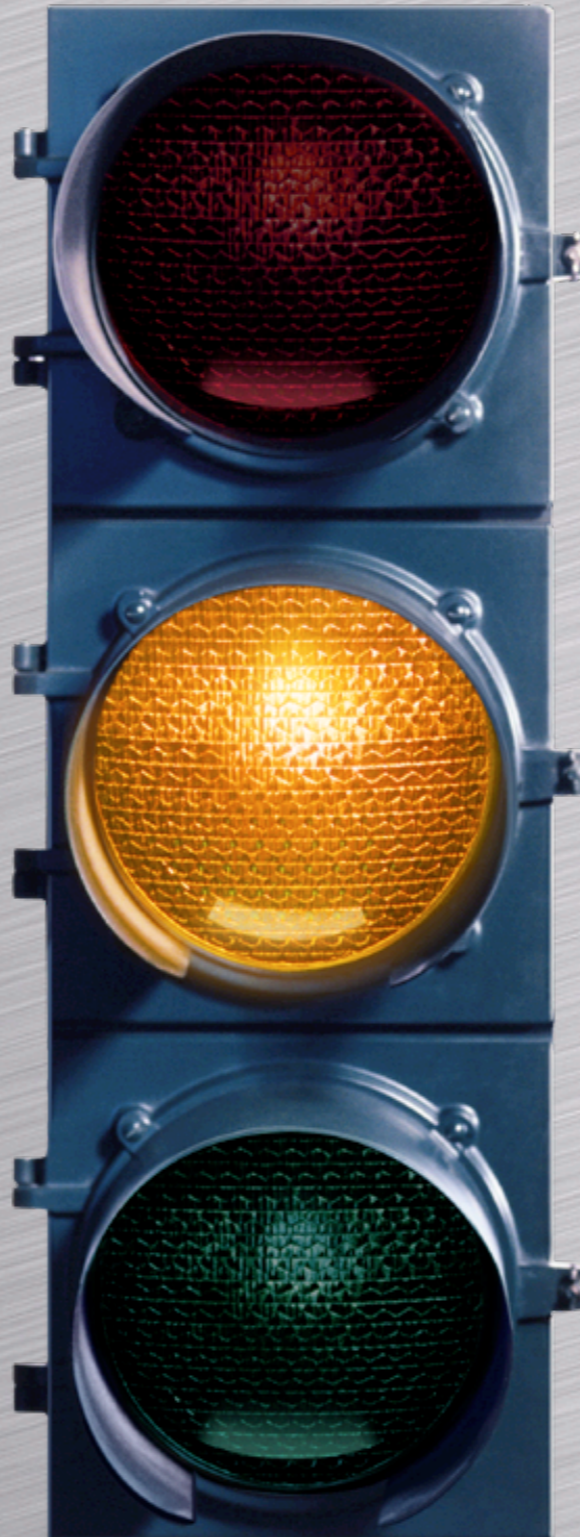
Running Thread



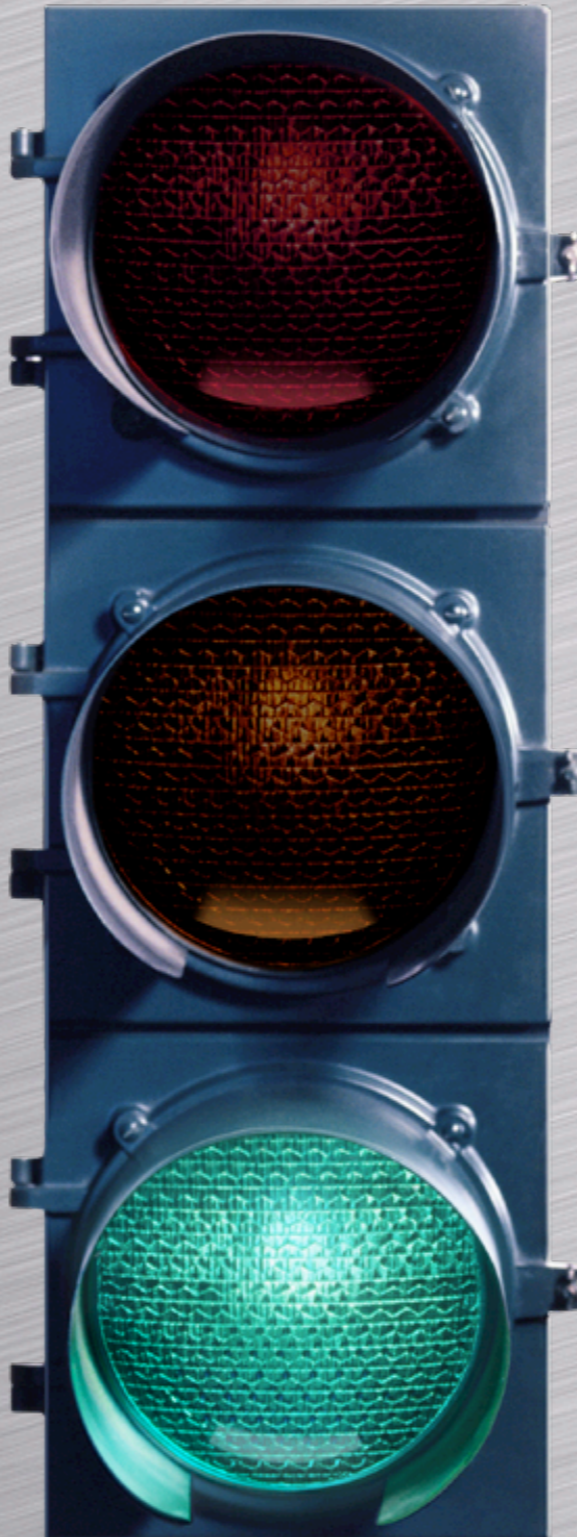
Blocked Thread



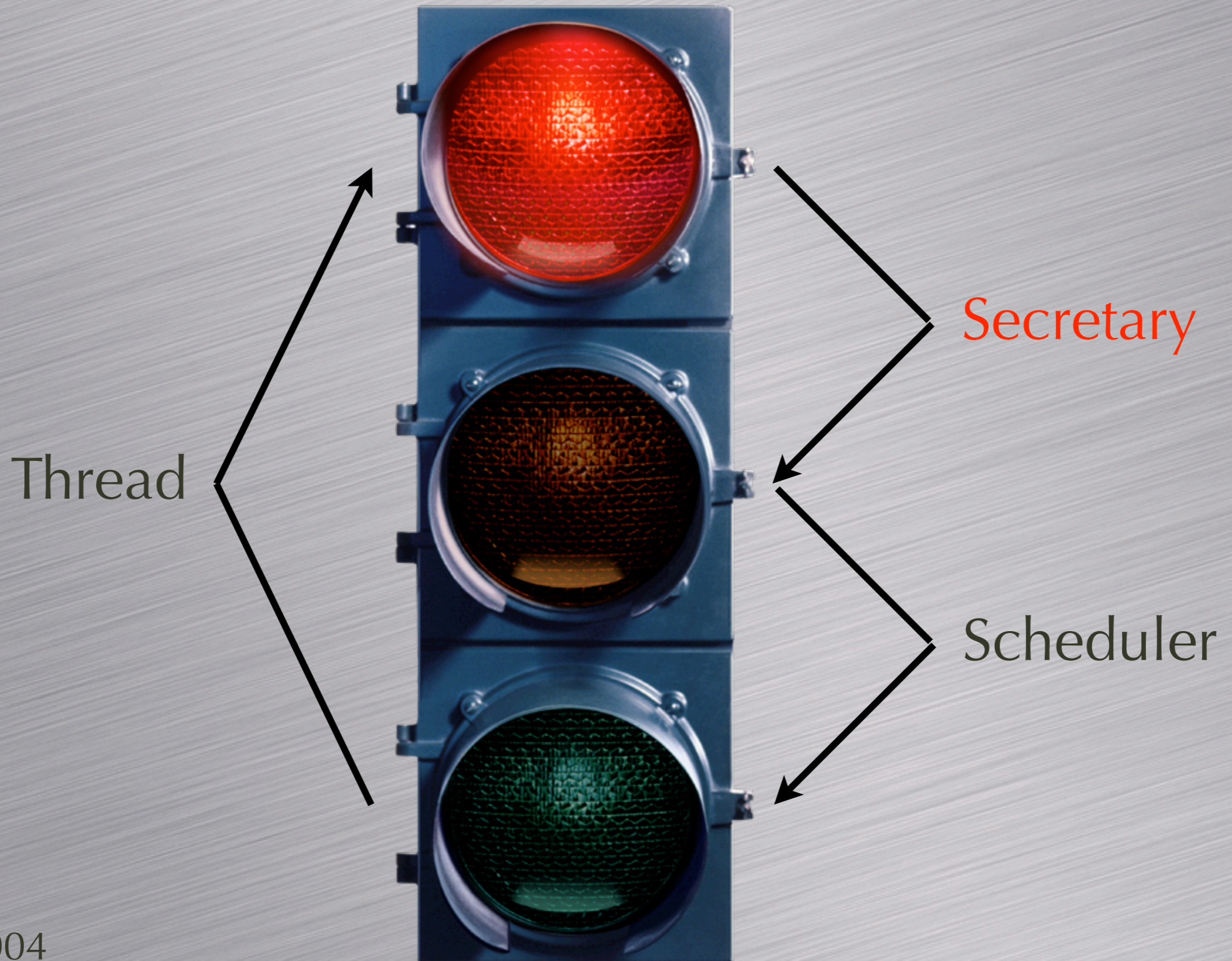
Released Thread



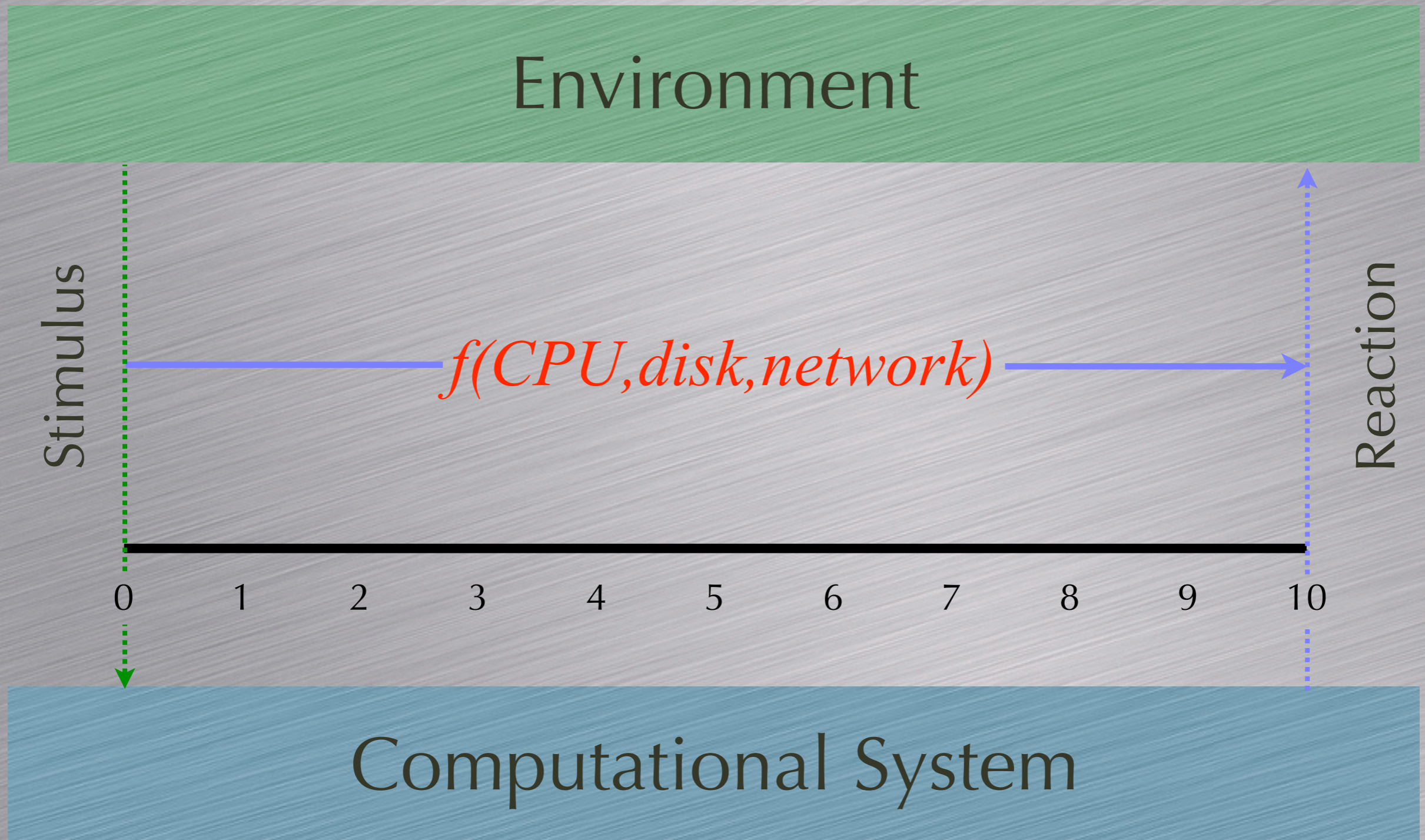
Running Thread



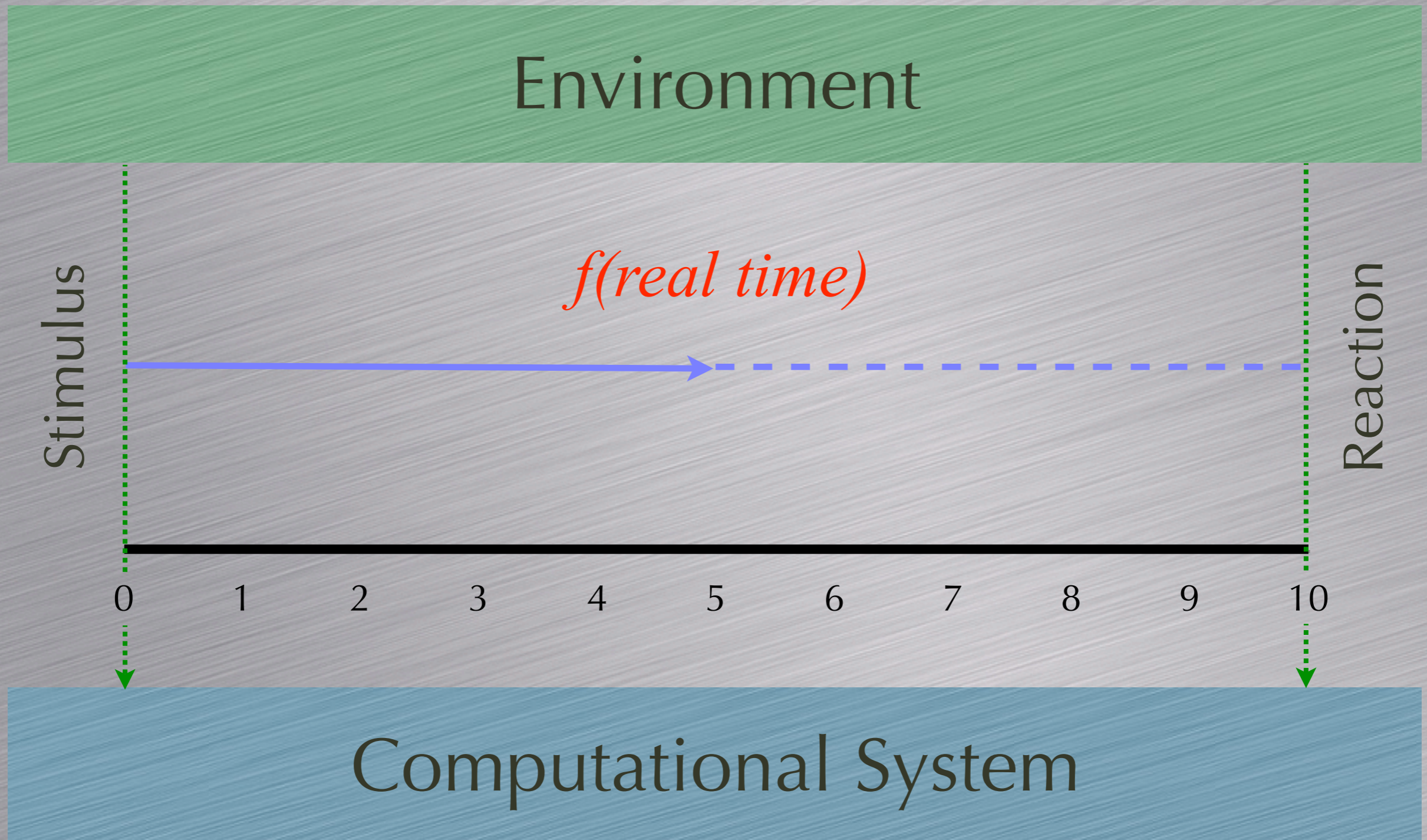
State Transitions



Secretary's Strategy



Compositionality



Thank you