

Software

What is an API?

- An API is an application programming interface used to accelerate application creation by providing programmers with a library of data structures, algorithms, and functions
- Examples: Google Maps API, SAGA, Rotten Tomatoes API, Twitter API

Why create an API?

- Separate modules simplify debugging
- Common reuse of functions requires less code
- Standardization of I/O data mitigates procedural error
- Easily expandable over time
- Each module provides users with an example of how new modules should work

Research

Motivation/Problem

The field of High Performance Computing needs a better method for analyzing vastly large amounts of output data without flooding networks and increasing the amount of computing carried out on High Performance Computers

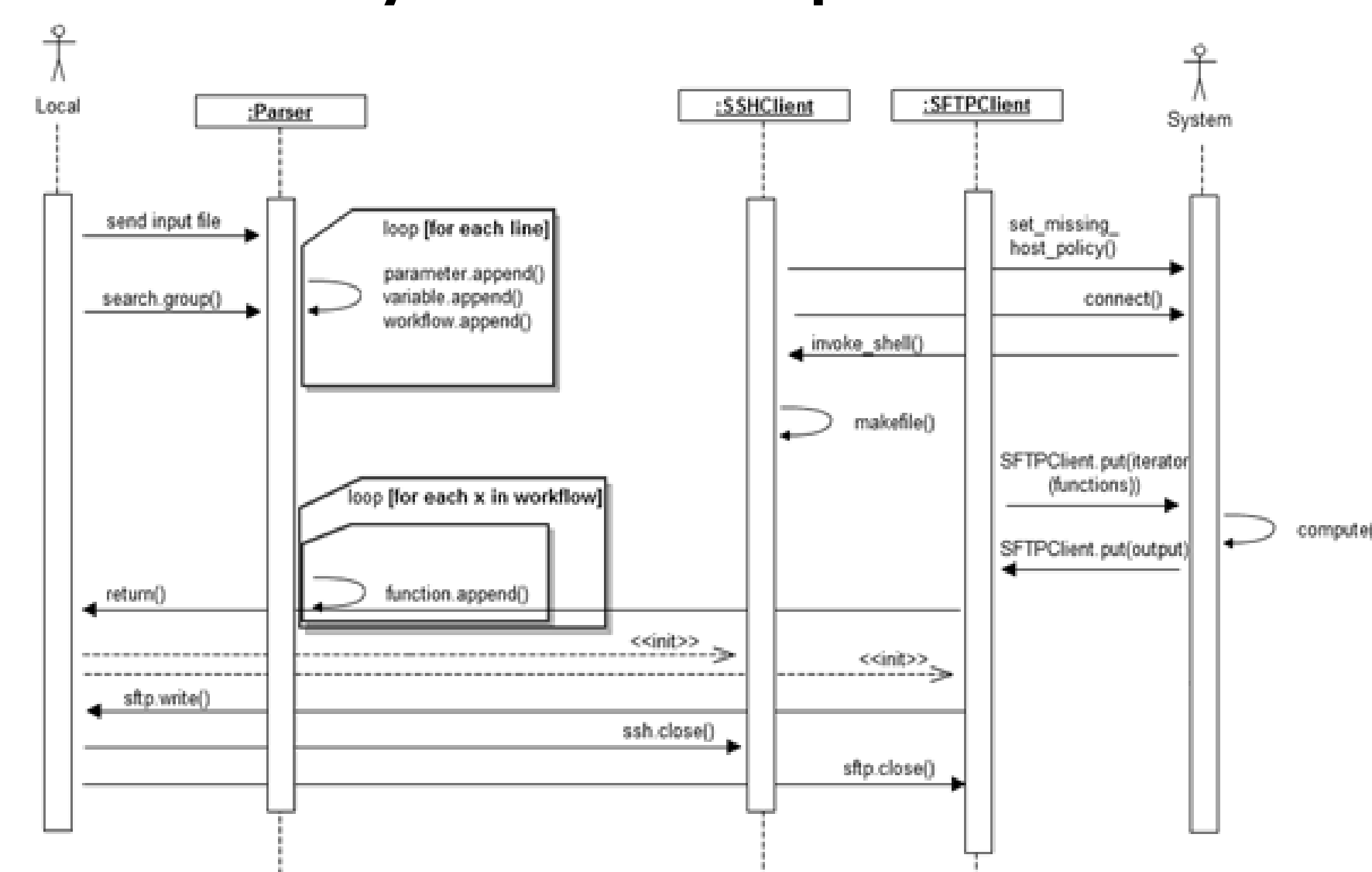
Proposed Solution

- Accelerators: devices attached to computers that can be utilized to perform analysis of data
- GPUs are perfect for highly parallel processes and data
- CPUs can be accessed for highly serial computations, and also when the GPU is being taxed to capacity

API f(x)

Random
Mandelbrot
CPUmin
GPUmin
CPUmax
GPUmax
CPUencrypt
GPUencrypt
CPUdecrypt
GPUdecrypt
TilePercent

System Sequence



Research Focus

Investigate the differences in simulation power and time consumption when offloading data analysis to accelerators, instead of incorporating it into simulation runtimes

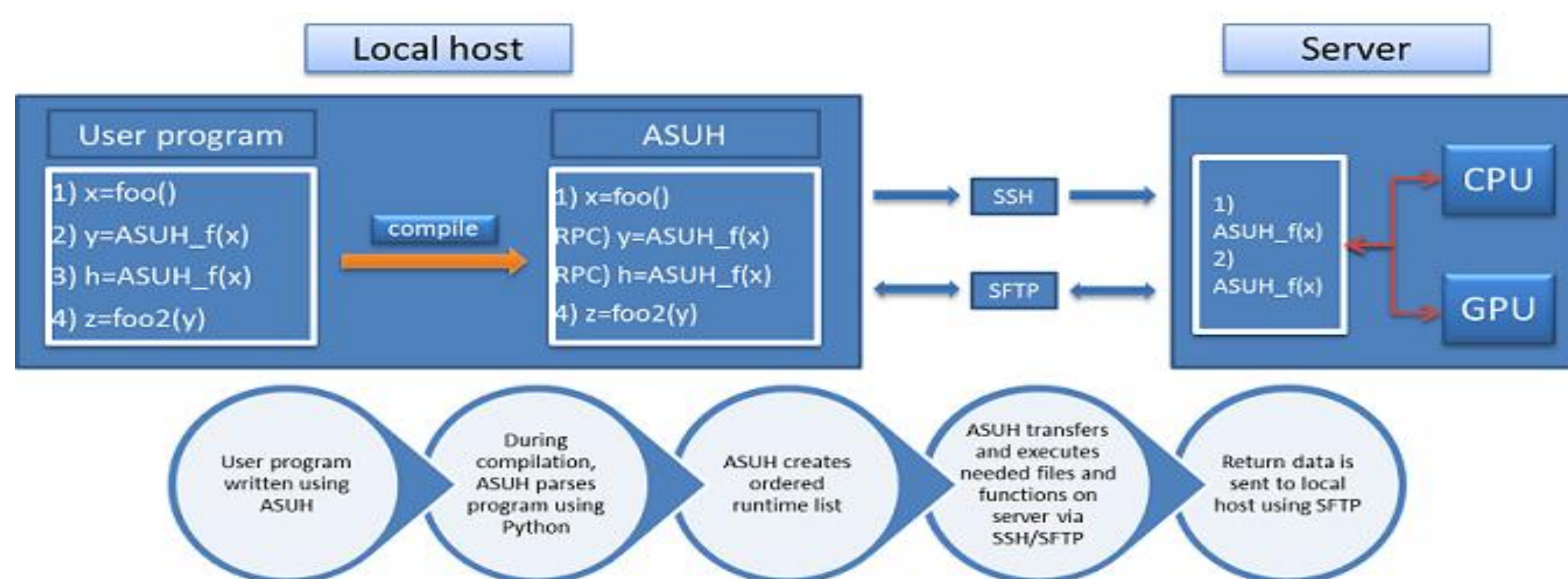
Acknowledgements

Dr. Ivan Rodero

Citations

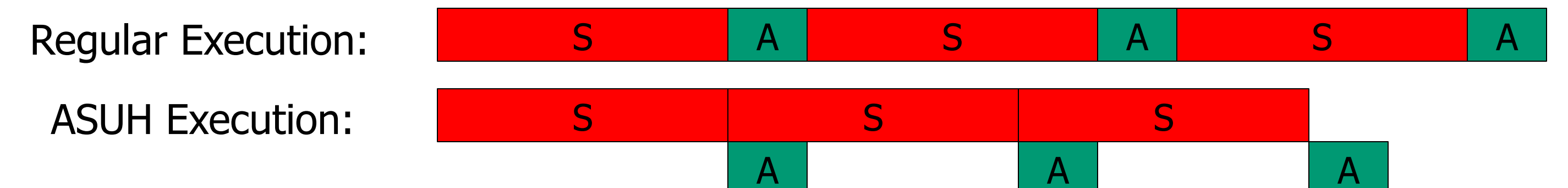
- http://developer.download.nvidia.com/compute/cuda/1.1-Beta/x86_website/projects/reduction/doc/reduction.pdf
- http://72.199.224.6:8085/aes256/aes256_cuda.html
- <http://mokandra.blogspot.com/2012/08/most-useful-openssl-command-line.html>

API System Operation Diagram



Diagrams and Graphs

Differences in execution time structure S: Simulation A: Analysis



ASUH vs Traditional HPC Execution Power

