PARSL AS A GATEWAY FOR RESEARCH COMPUTING AT A LIBERAL ARTS COLLEGE

BEN GLICK, LEWIS & CLARK COLLEGE*
About Our Needs

- Me: Recent graduate at Lewis & Clark
  - Who helps out every now and again
- Research computing office
  - Small HPC system shared by whole college
  - Balanced demands between research & teaching
  - (Extremely) limited support
Examples

* Comp. Statistical Mechanics

![Graph of M(T) and E(T)](image1)

![Graph of C(T) and X(T)](image2)

* Bioinformatics / Phylogenetics

![Phylogenetic tree](image3)

* HPC/CS Education

![Diagram of XOR-based tree reduction](image4)

Fig. 1. XOR-based tree reduction as implemented in our assignment. Here, comm_sz is 8.

* Scientific AI
Problem Overview

- Lack of experience
- Usability challenges
- Lack of support staff
- Researchers lack HPC know-how
- Dealing with CLI is a pain point
- Dealing with LRM is a pain point
Solution: Parsl as Infrastructure

Users never see LRM

Login Node

Worker Nodes

Parsl Spawner

LRM
Things we love about Parsl and some future desires

- Love: Level of abstraction (control of execution environment, dataflow)
- Love: Python as a single point of debugging
  - Serverless Supercomputing
- Love: FuncX!

- Desire: Interactive management/reconfiguration of tasks
- Desire: Transfer task across pilot job
Conclusions

- Parsl helps us provide a uniform interface not dependent on knowledge of HPC systems.
- Thanks to the Parsl team!
- Thanks to Jeremy McWilliams, Mohamed Anber, Greta Binford, and Jens Mache at Lewis & Clark.
- Feel free to email glick@lclark.edu with questions.