MICHIGAN STATE UNIVERSITY

Project Plan

Simplifying High Performance Computing

The Capstone Experience

Team Michigan State University HPCC

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Spring 2019

From Students…
…to Professionals

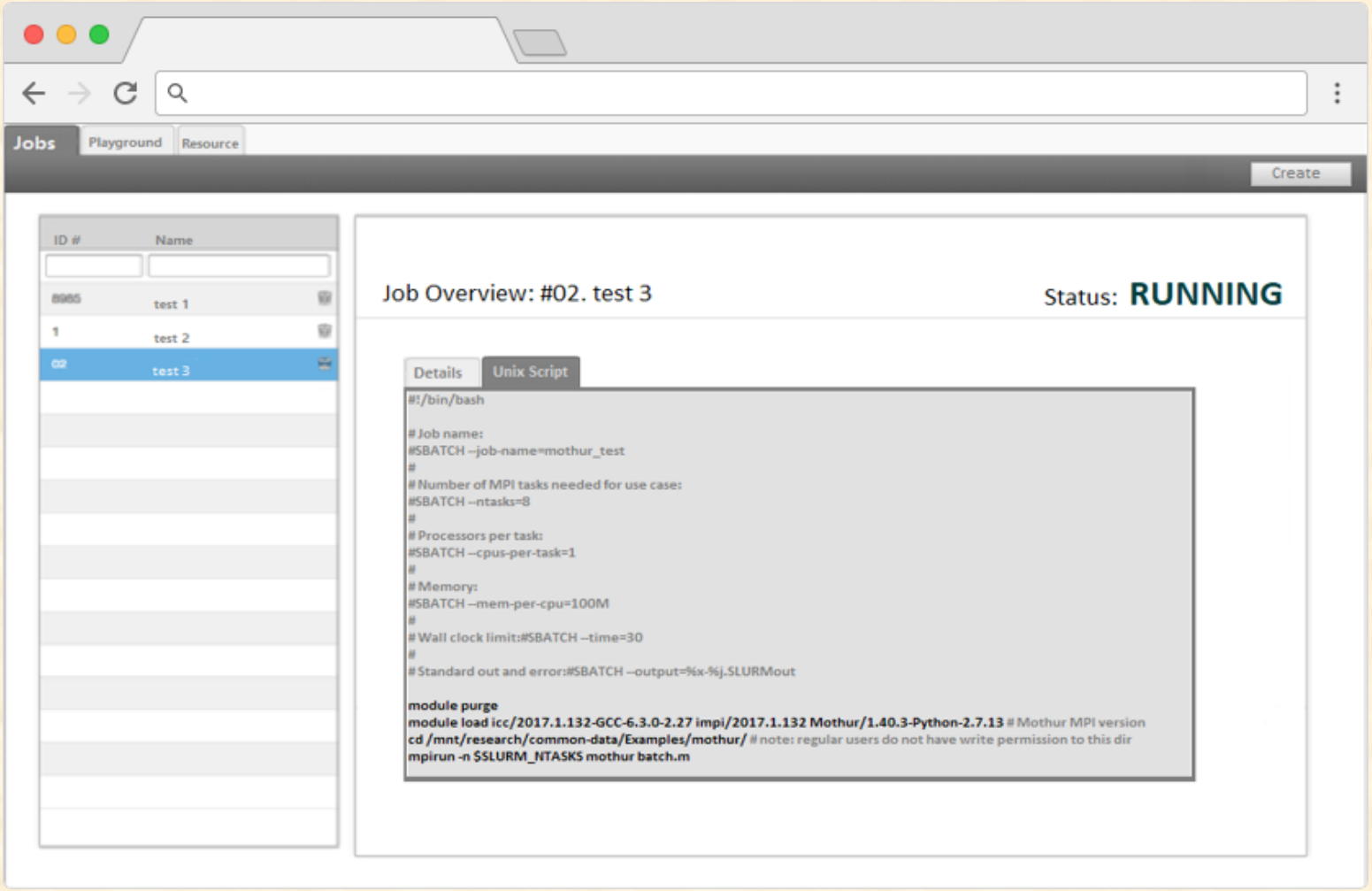
Functional Specifications

- HPCC uses SSH/terminal and bash scripts to submit jobs.
- Researchers may not have strong technical background and find this difficult.
- Purpose is to create a Web app to view job statistics and create bash scripts for them
- This will make HPCC more accessible and friendlier to researchers.

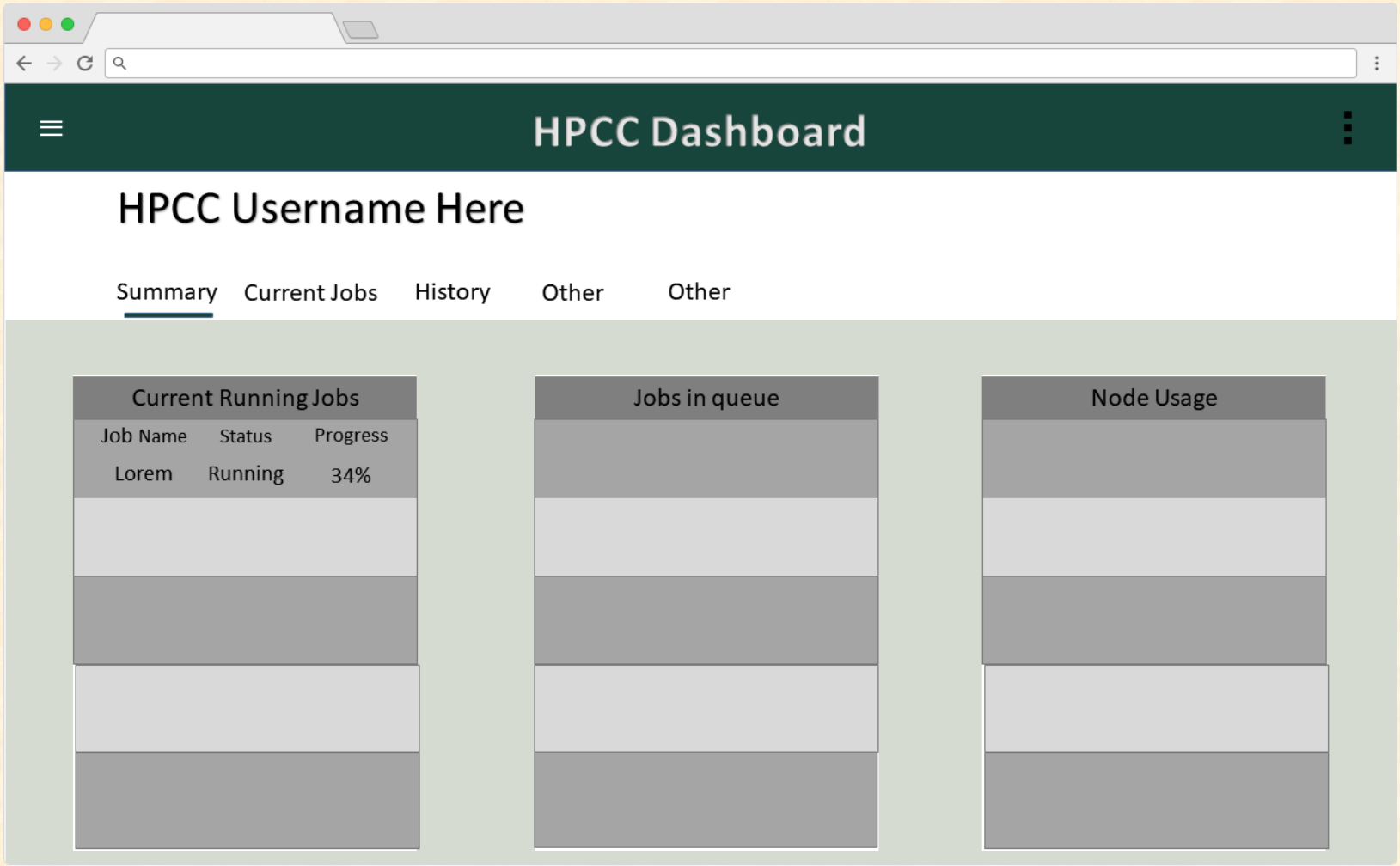
Design Specifications

- Webpage User Interface
- UI to view job statistics
- Bash Script Generator
- Group/Admin Tools (stretch goal)
- Job Test Environment (stretch goal)

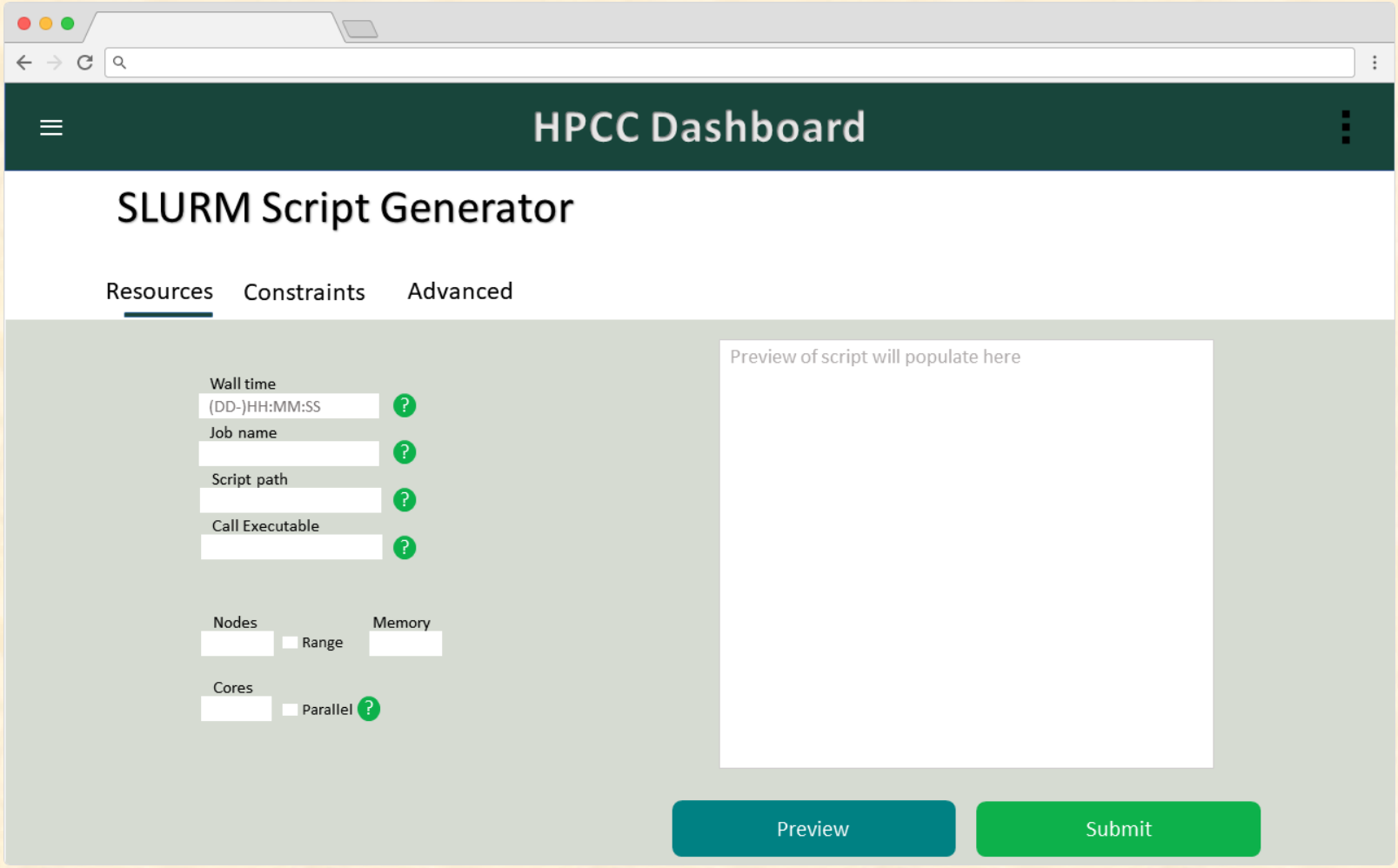
Screen Mockup: Job Overview



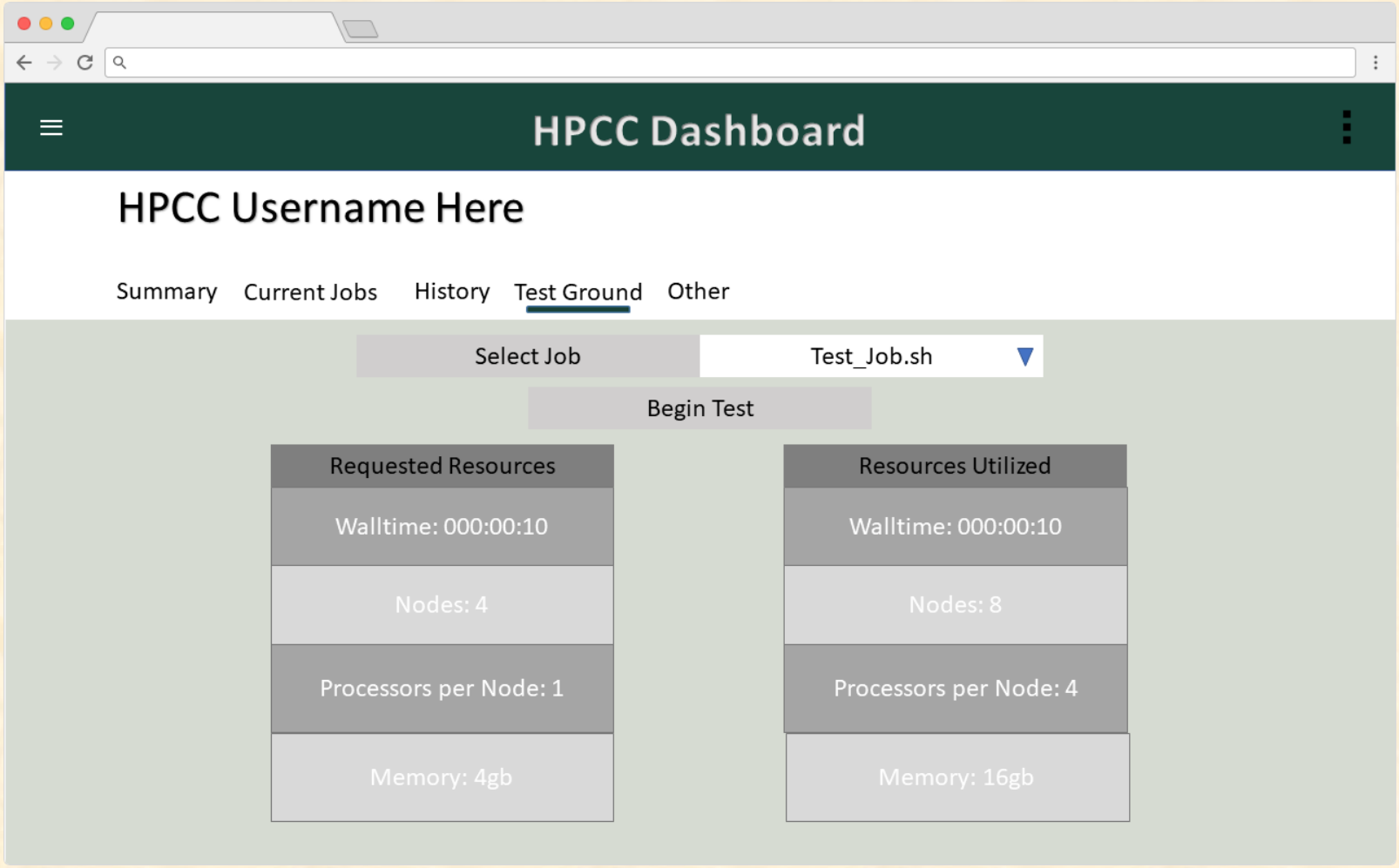
Screen Mockup: Administrator



Screen Mockup: Script Generator



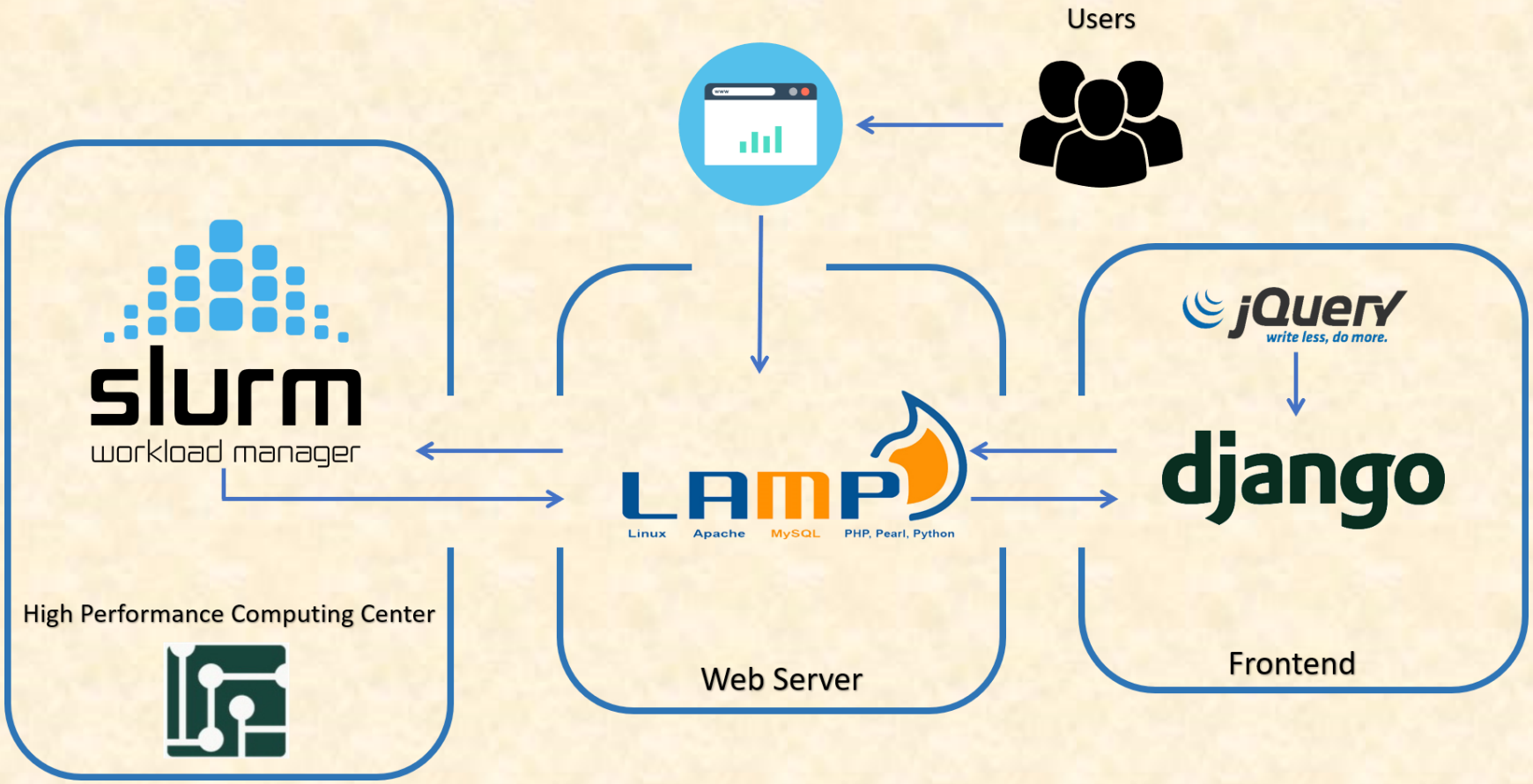
Screen Mockup: Playground



Technical Specifications

- Cluster Job Scheduler – Slurm
- Web Server – CentOS, Apache2, MySQL, Python
- Web full stack framework – Django
- Frontend UX - JavaScript with jQuery

System Architecture



System Components

- Hardware Platforms
  - The HPCC
  - Dell Servers
- Software Platforms / Technologies
  - OpenHPC
  - JQuery
  - Django
  - SLURM
  - MySQL Database

Risks

- **Simulating the HPCC**
  - Cluster setup has stalled due to hardware limitations.
  - Working with system admin on alternative cluster setup. Also looking into different workflows which will support script testing without cluster.
- **Connecting cluster to website**
  - Connect website to scheduler without a cluster
  - Prototype simple echo application to test/debug Slurm to Django interface.
- **Unsure how to implement admin privileges**
  - HPCC has various levels of administrator privilege for controlling user actions
  - Discuss with HPCC admins the hierarchy and organization of privileges
- **Don't know how to implement an isolated playground cluster**
  - Need a testing environment to see if a job utilizes appropriate resources
  - Examine similar testing environments. Stretch goal that isn't required.

Questions?