

Developing A User Interface for DUNE HEPCloud

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Introduction

The Deep Underground Neutrino Experiment (DUNE) operates on complex algorithms to study neutrino physics.

- Computation jobs require hundreds of millions of CPU hours
- Need for high performance computing (HPC) and dynamic resource provisioning.

HEPCloud

Gateway for a wide-range of scientific computing resources.

- Hosts the HEPCloud Decision Engine.
- Decision Engine determines which cluster is most appropriate to run user-submitted jobs.

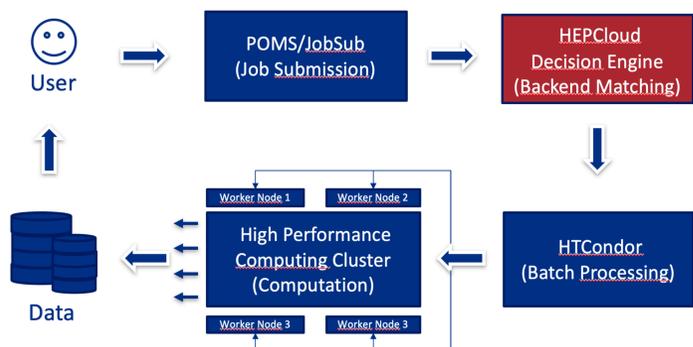


Figure 1 – DUNE Workflow

Challenges

- HEPCloud Decision Engine is largely a black box for users.
- Potential for misallocated resources and missed opportunities.
- Lack of user confidence and awareness

Objective

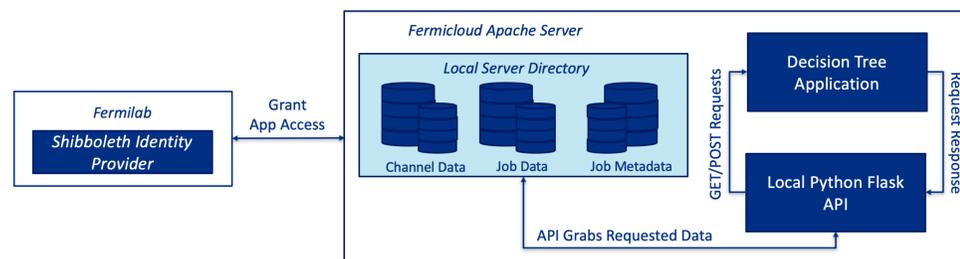
Build a user interface that allows DUNE scientists to:

- Read + Write the global state of the Decision Engine.
- Read + Write job-specific parameters.
- Read Decision Engine data about cluster backend-matching.

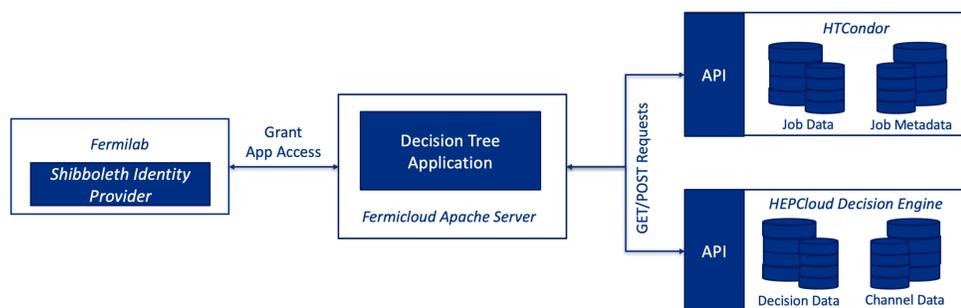
In order to:

- Increase system transparency
- Increase user control over job parameters.

Development Server Configuration



Future Server Configuration



Technologies

Name	Purpose
Angular + TypeScript	Web Framework
HTML + CSS + JavaScript	Application Structure, Styles, and Behavior
Python	API Configuration
Apache	Web Server
Figma	Prototyping Tool
Git	Version Control

Application Features and Interface

- Single-Sign On (SSO)
- [A] View Global State
- [B] View Job Data
- [B] View Decision Data
- [C] Filter Jobs by Classads
- [A] Modify Global State
- [B] Modify Job Parameters

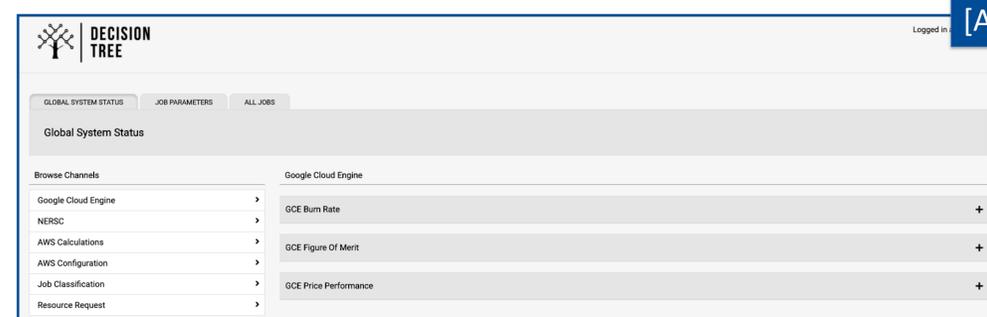


Figure 2 – Decision Tree Application Global State

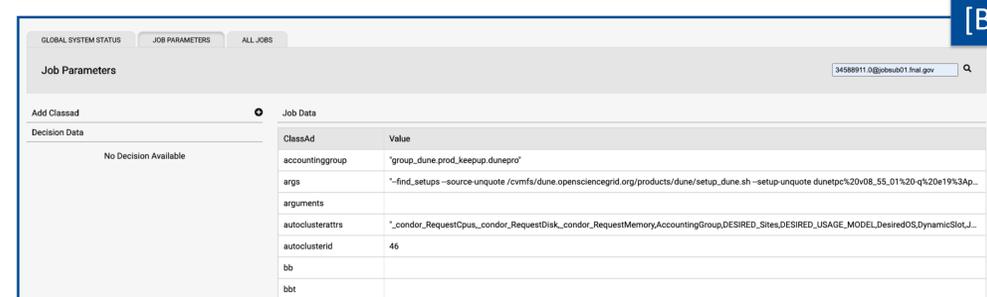


Figure 3 – Decision Tree Application Job Page

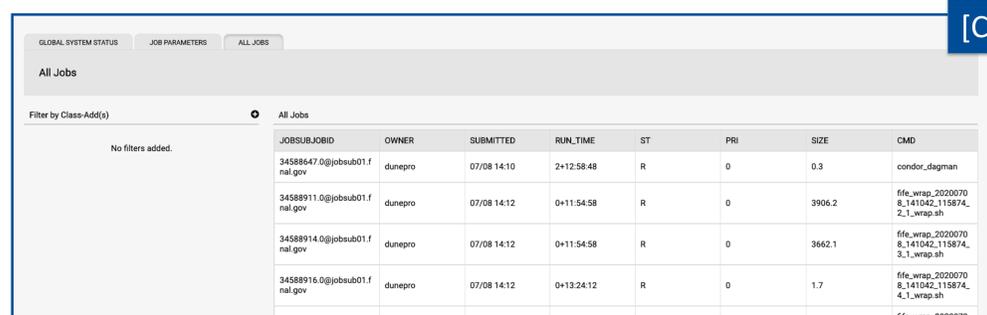


Figure 4 – Decision Tree Application All Jobs Page

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