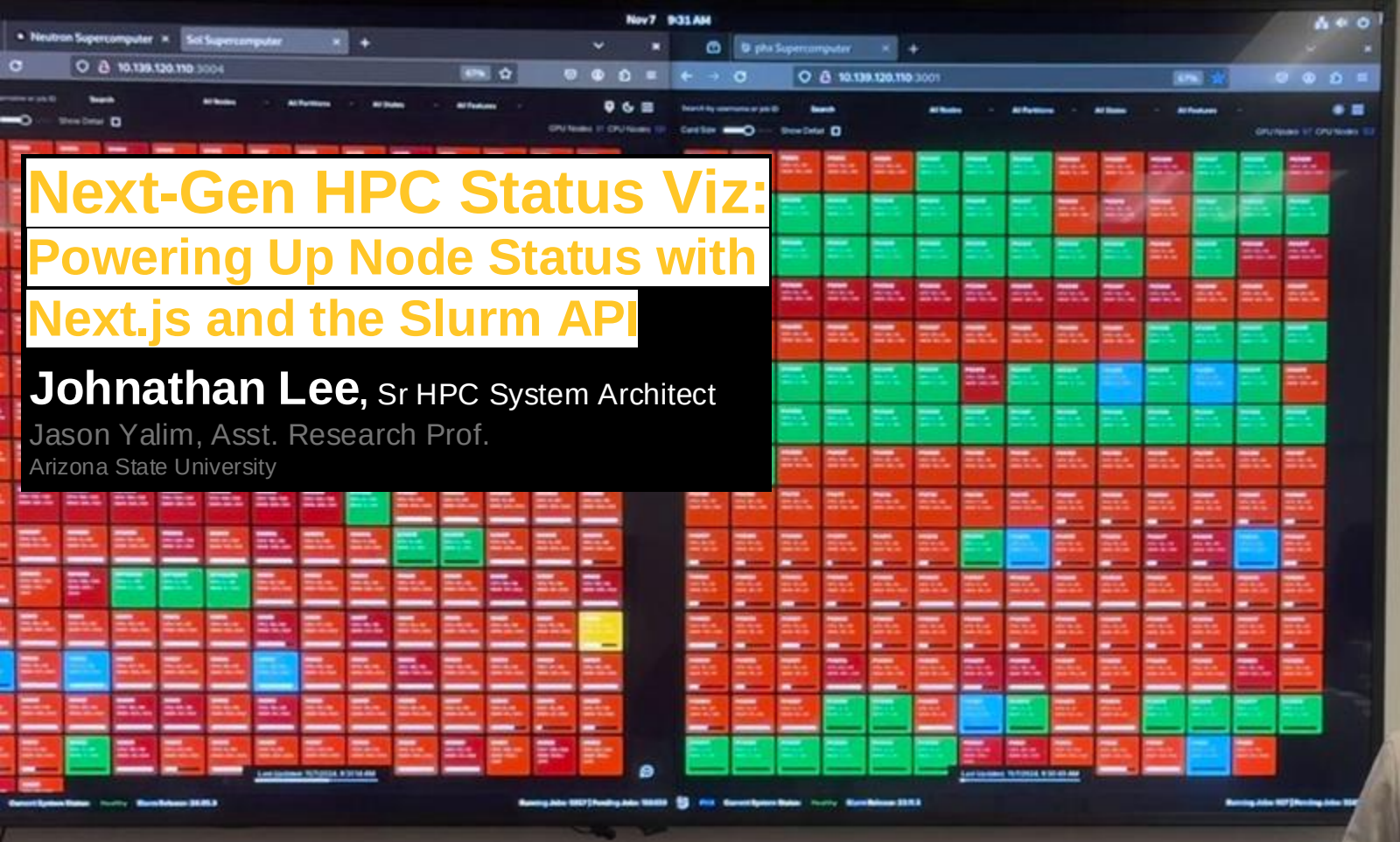
Next-Gen HPC Status Viz: Powering Up Node Status with Next.js and the Slurm API

Johnathan Lee, Sr HPC System Architect
Jason Yalim, Asst. Research Prof.
Arizona State University



github.com/thediymaker

What is it?

HPC Node Dashboard for Slurm

- Displays node status for end users
- Shows running and completed job details, including efficiency
- Cluster status information
- Historical cluster status
- Module information

How is it used at ASU?

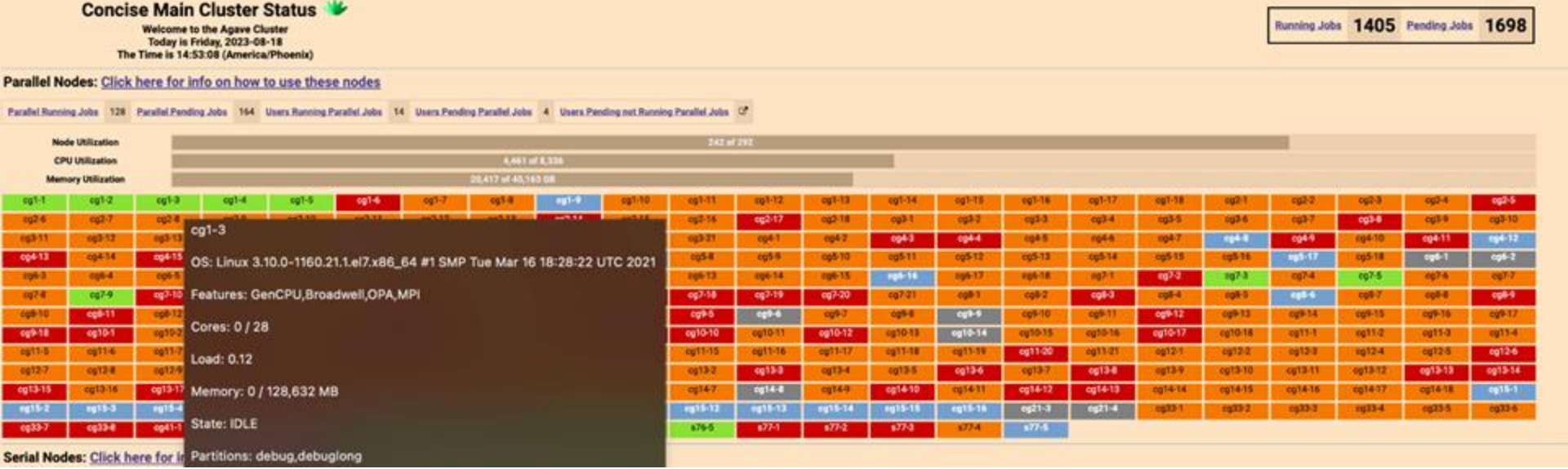
Integration with Open OnDemand - or standalone

- ASU is a long time OOD user (since SC19)
- Dashboard displayed via OOD app in an iframe
- Dashboard also available standalone for displaying in NOC like environment.

Why?

Why did we create this application?

- Initially had a PHP based system with limitations
- Needed a more modern dashboard
- Wanted to use the API for more real time data
- Researcher as the primary audience, but turned out to be a great tool for sysadmins

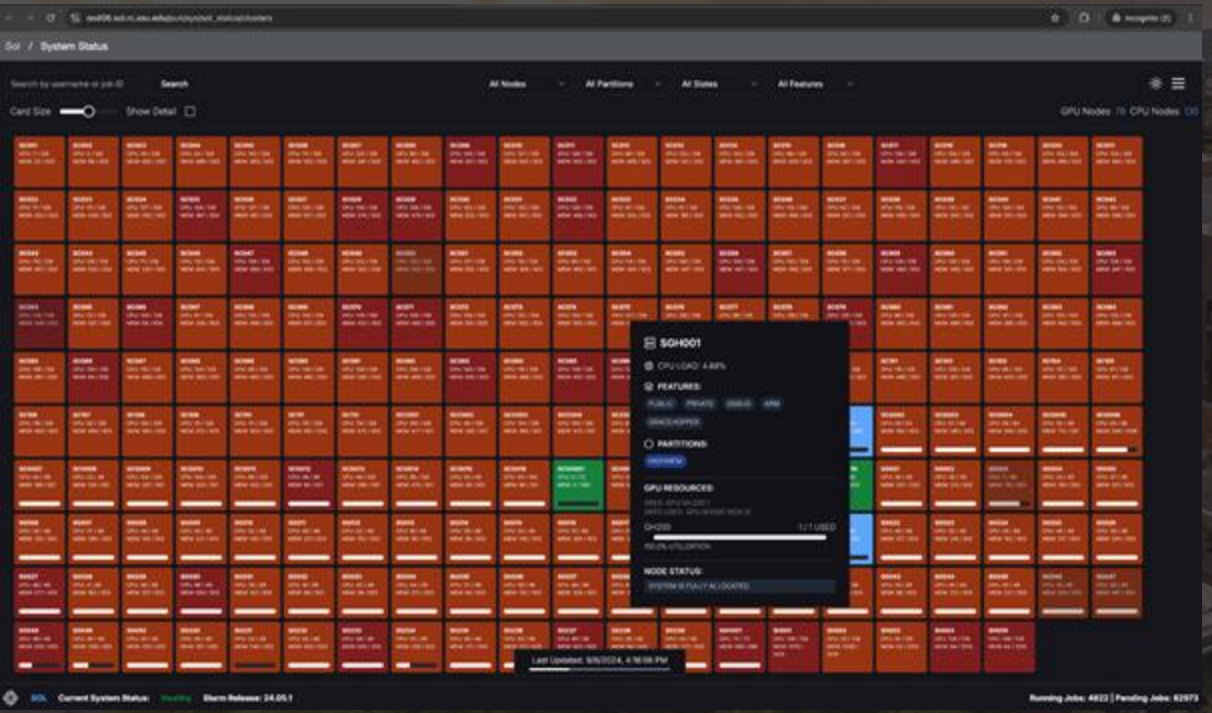


Previous Dashboard

- PHP based
- Custom SQL queries
- Slow ~ 2 minutes to pull and refresh data

New dashboard

Live Node Status

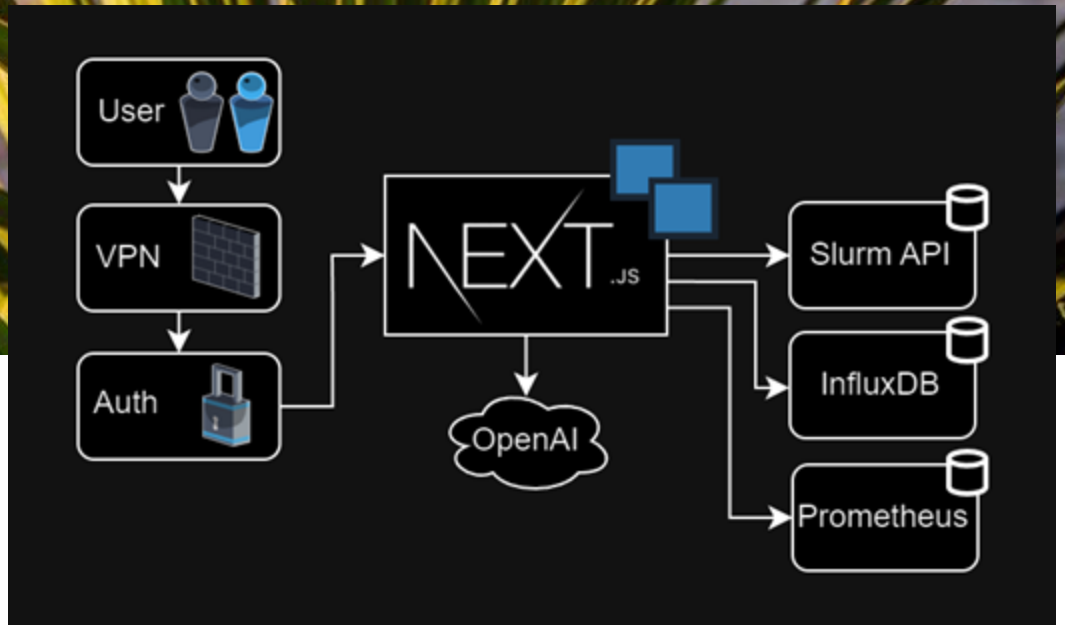


Historical view

Slurm

Slurm API

- Difficulty enabling Slurm API, documentation not great
- Great for pulling data — not so much for updating data
- 1 api call ~ 30 seconds per refresh.



Overview

- Next.js
- Slurm API
- Ability to display prometheus data
- SSL + Auth behind VPN and Apache

Completed Job Details: 18249665 COMPLETED

Job ID	User / Group	Runtime / Efficiency	Exit Status
18249665	[redacted]	13h 23m 10s	SUCCESS

Job Details

Nodes	Partition	QoS
sc091	general	public
State	**Reason**	**Priority**
COMPLETED	None	26690332
Start Time	**End Time**	**Elapsed Time**
9/2/2024, 5:05:09 PM	9/3/2024, 6:28:19 AM	13h 23m 10s
CPUs Requested	**Memory Requested**	**Time Limit**
8	16 GB	1h 36m 0s

Resources

Requested Resources	Allocated Resources
cpu: 8	cpu: 8
mem: 16384 MiB	mem: 16384 MiB
node: 1	node: 1
billing: 12	billing: 12

Flags

STARTED_ON_BACKFILL START_RECEIVED

Job Steps

batch (ID: 18249665.batch)
Nodes: 1 (sc091)
Tasks: 1
Start Time: 9/2/2024, 5:05:09 PM
End Time: 9/3/2024, 6:28:19 AM
Memory Used/Allocated: 7.677 / 16.000 GiB

extern (ID: 18249665.extern)
Nodes: 1 (sc091)
Tasks: 1
Start Time: 9/2/2024, 5:05:09 PM
End Time: 9/3/2024, 6:28:19 AM
Memory Used/Allocated: 0.000 / 16.000 GiB

Job Details

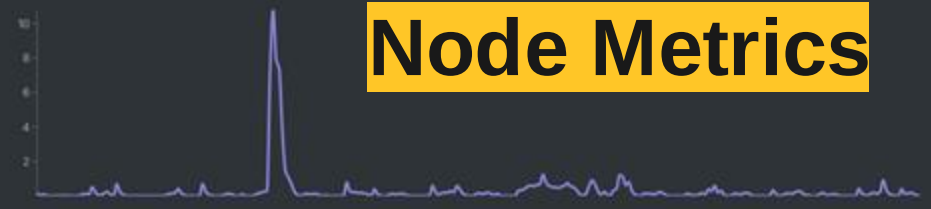
Runtime / Efficiency

13h 23m 10s

CPU Efficiency: 94.89% (A)
Memory Efficiency: 47.98% (F)

sdg051 Metric 15 minute load average Time 3 days

System Metrics

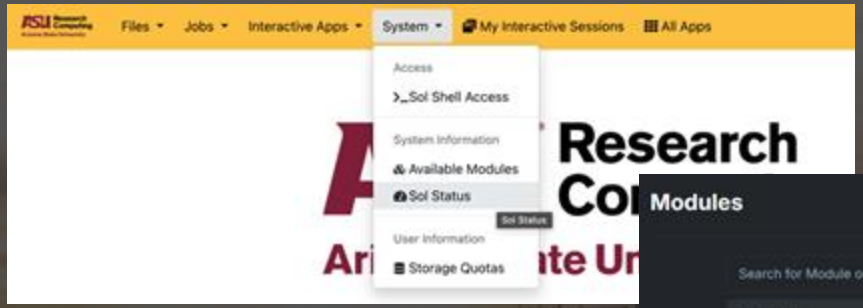


Node Metrics

Current Jobs on System

Job ID	Task ID	User	Job Name	Partition	Group	QOS	Start Time
8544	N/A	jeburks2	gpuJob.sh	general	grp_rcadmins	public	8/8/2024, 8:17:15 AM

Total Number of jobs running on system: 1



Open OnDemand

System Modules

Modules

Search for Module or Version

10

Module Name	Versions	Description
ZSTD-1.5.2-GCC-11.2.0		Zstandard, or zstd as short version, is a fast lossless compression algorithm, targeting rea...
GAWK-5.1.1-GCC-11.2.0		If you are like many computer users, you would frequently like to make changes in various...
IRODS	adm	iRods adm tool
LIBEVENT	2.1.12	libevent 2.1.12
GFLAGS-2.2.2-GCC-11.2.0		The gflags package contains a C++ library that implements commandline flags processin...
DIAMOND-2.0.15-GCC-12.1.0		in and translated DNA searches, designed for hi...
GCC-11.2.0-GCC-8.5.0		nt ends for C, C++, Objective-C, Fortran, Ada, a...
CONVERGE-CFD		
TMUX-3.3A-GCC-12.1.0		'mux is a terminal multiplexer. What is a terminal ...
ORTHOMCL		

gflags-2.2.2-gcc-11.2.0

The gflags package contains a C++ library that implements commandline flags processing. It includes built-in support for standard types such as string and the ability to define flags in the source file in which they are used. Online documentation available at: https://gflags.github.io/gflags/

Available Versions:

*

Total Number of Modules 622

1 2 3 4 5 6 7 8 9 ... 63

NEUTRON Current System Status: Healthy Slurm Release: 24.05.0

Running Jobs: 0 | Pending Jobs: 0

AI tools

Chat Function Evolution

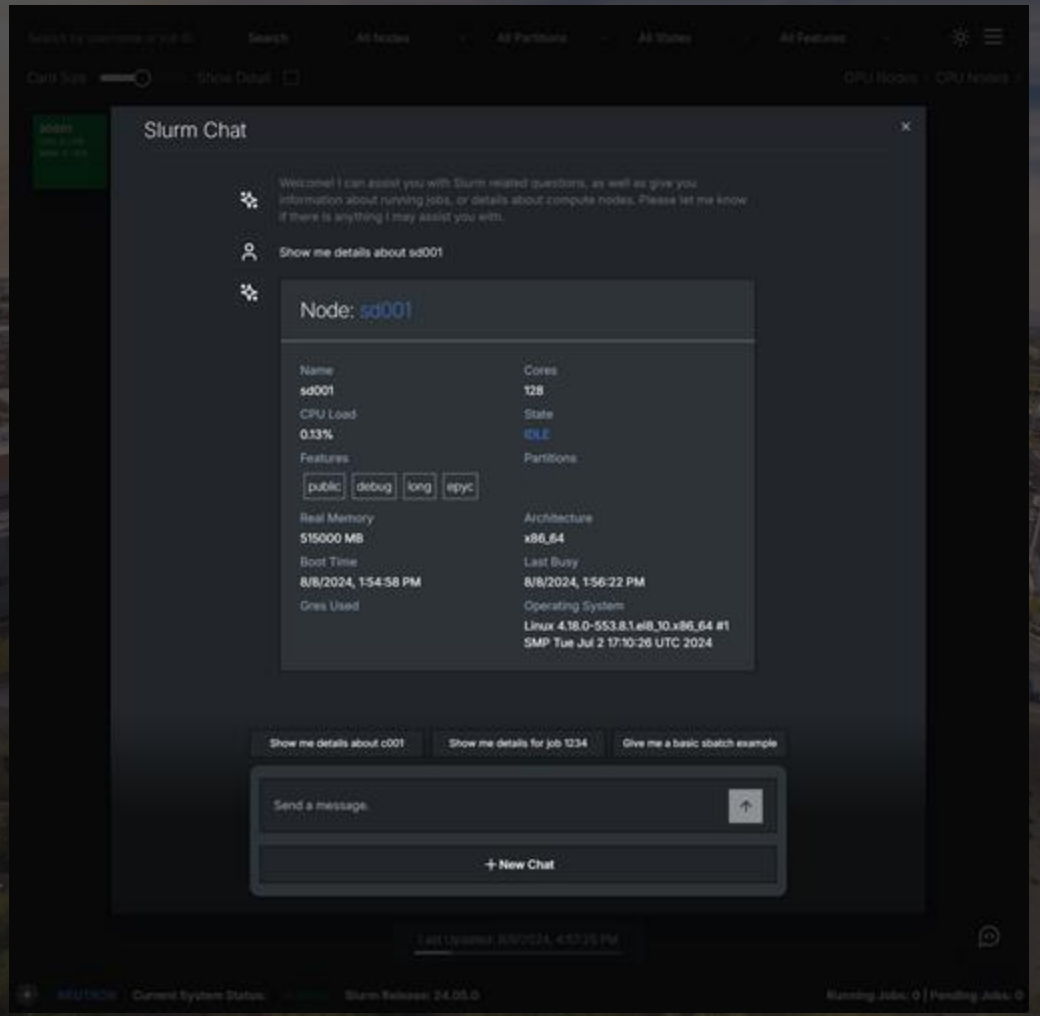
- Current capabilities
- Integration with Slurm
- Natural language processing
- Future enhancements

Embeddings System

- Vector search implementation
- Documentation integration
- Use cases and benefits

Database Details

- PostgreSQL with vector extension



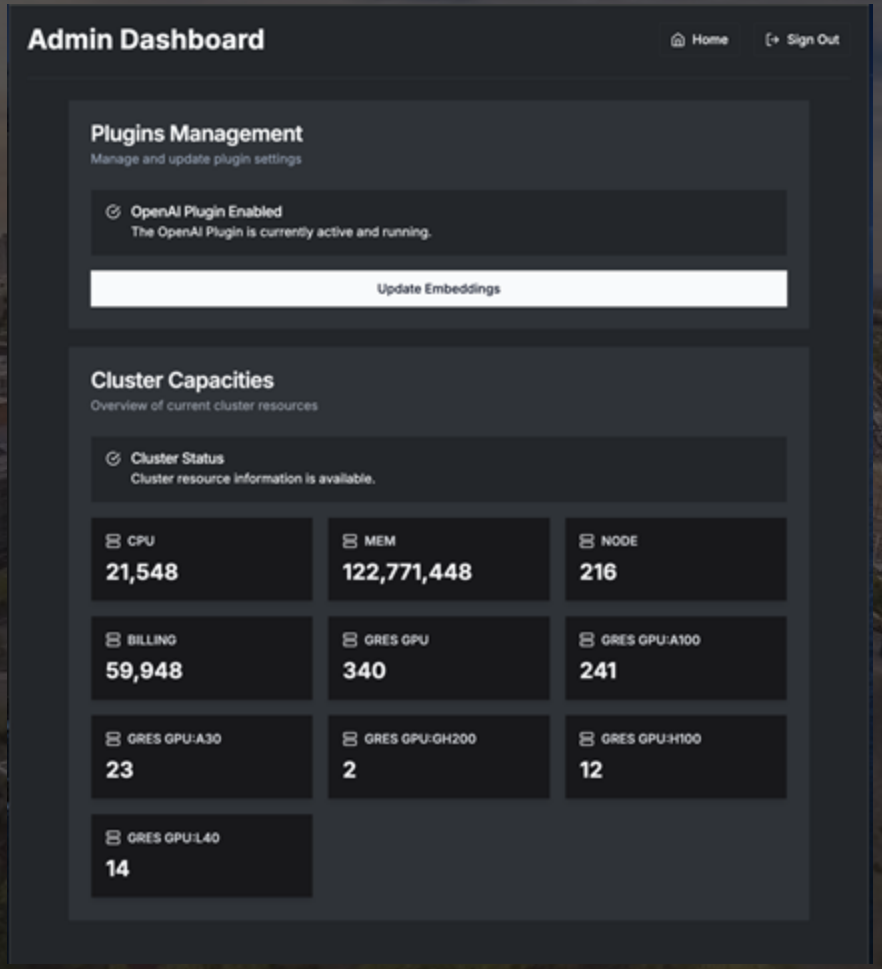
Future Roadmap

GitHub Repository

- Open source strategy
- Issue tracking

Administrative Features

- Admin panel overview
- Upcoming features
- Security considerations
- Customization options



Video Demo

Quickstart

Iframe OOD

Q&A Session

https://github.com/thediymaker

@thediymaker.bsky.social

Github