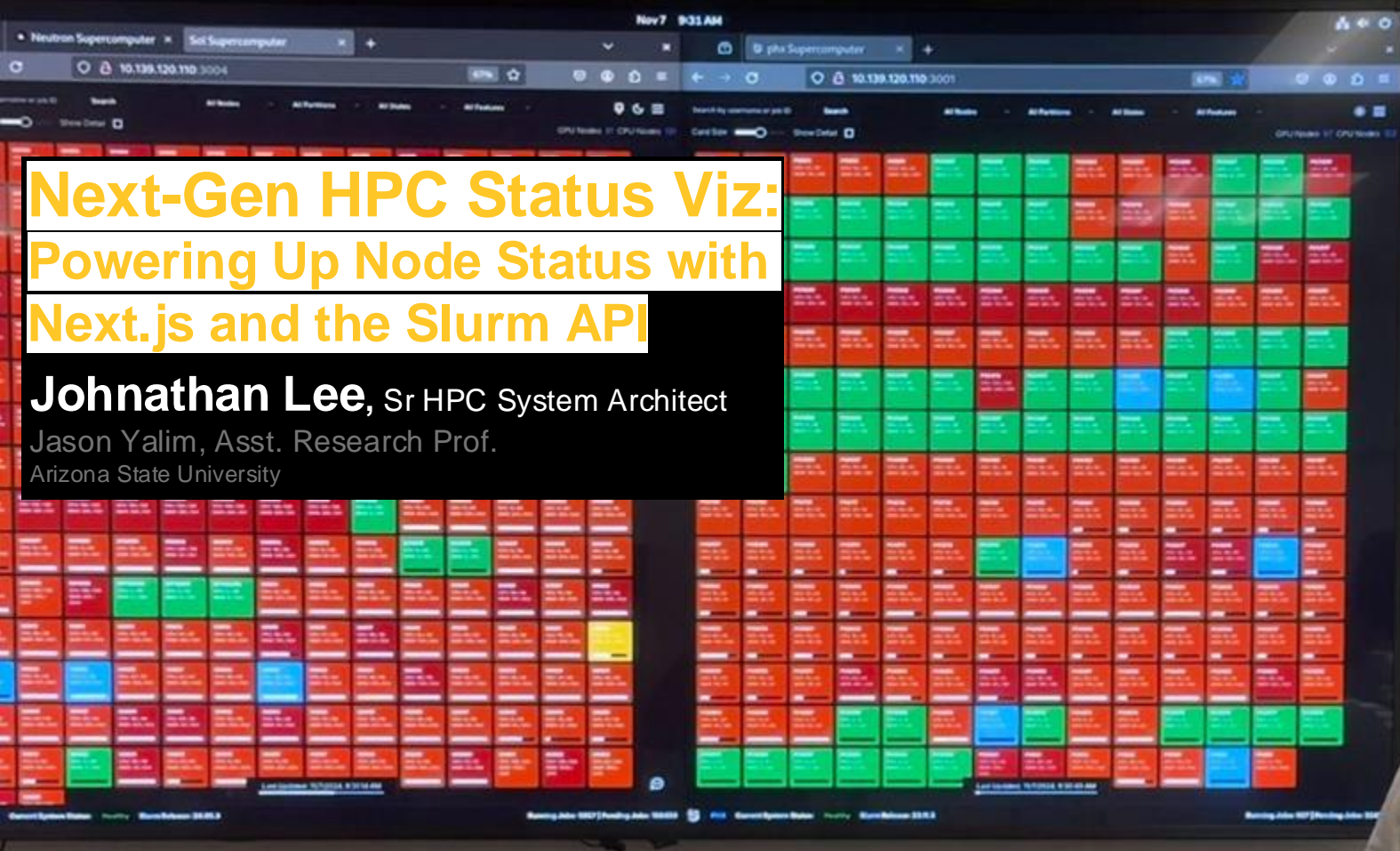




Next-Gen HPC Status Viz: Powering Up Node Status with Next.js and the Slurm API

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



github.com/thediy maker



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

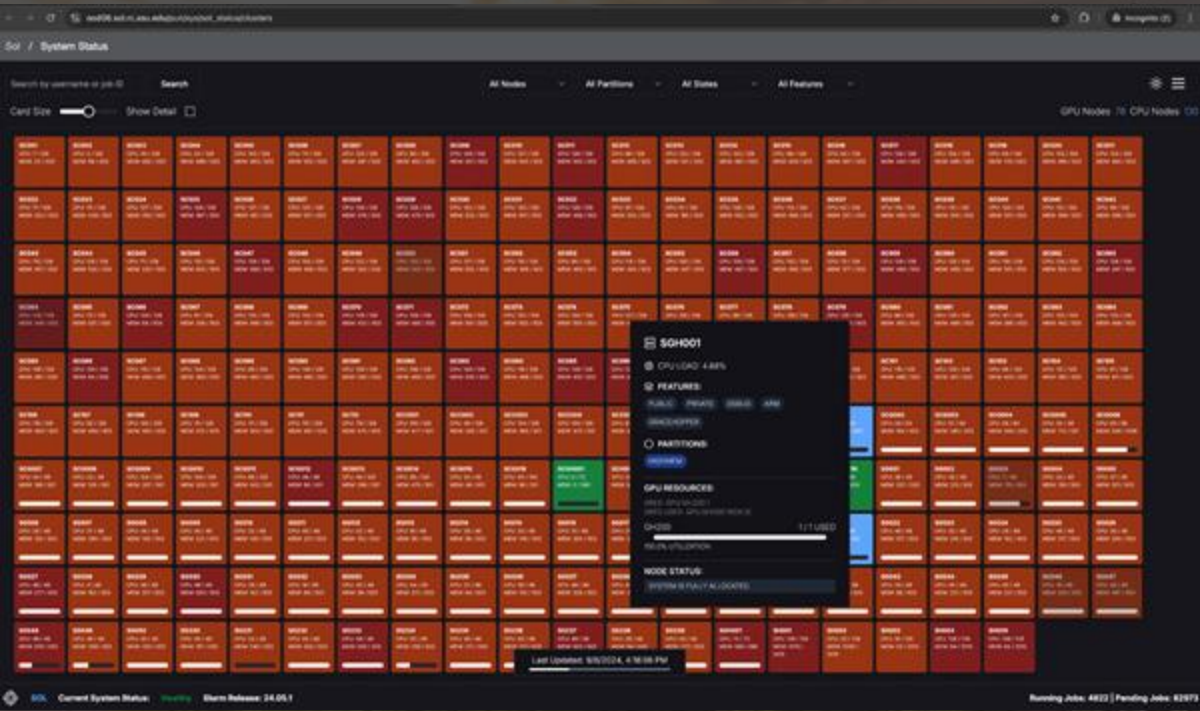




New dashboard

Historical view

Live Node Status



A photograph of a server rack with several units. The units have green indicator lights glowing, and some have blue lights at the bottom. The rack is dark, and the lights create a high-contrast scene.

Slurm

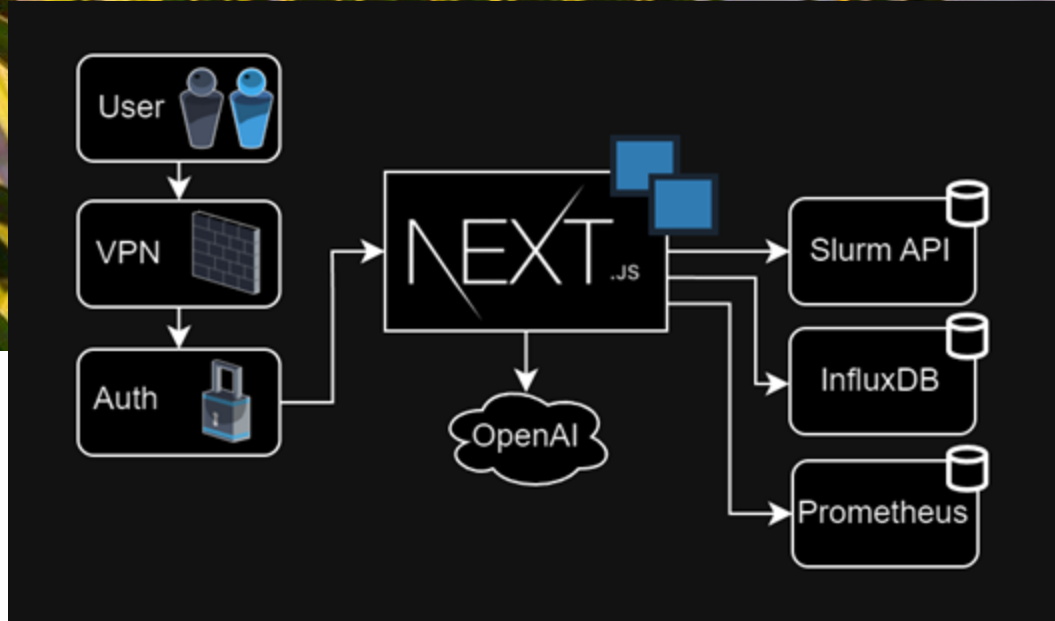
Slurm API

- 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
18249665
run_scratched_onoff.sh

User / Group

Runtime / Efficiency
13h 23m 10s
CPU Efficiency: 94.89%(A)
Memory Efficiency: 47.98%(E)

Exit Status
SUCCESS
Code: 0

Job Details

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

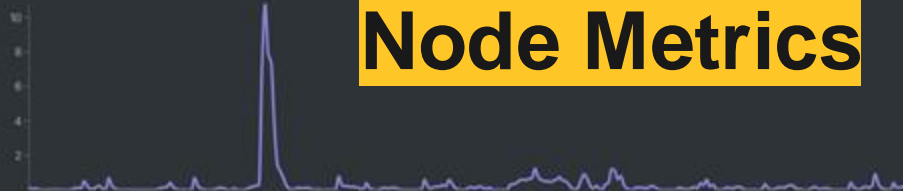
CPU Efficiency: 94.89%(A)

Memory Efficiency: 47.98%(E)

sdg051

Metric 15 minute load average Time 3 days

System 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

ASUArizona State University

Files ▾Jobs ▾Interactive Apps ▾System ▾My Interactive SessionsAll Apps

Access

>_Sol Shell Access

System Information

Available Modules

Sol Status

User Information

Storage Quotas

Research

Core

Modules

Arizona State University

ite Un

Open
OnDemand

System Modules

Search for Module or Version10

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-5.11-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	---	int 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	---	
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

The screenshot displays the Slurm Chat web interface. At the top, there's a navigation bar with links for Search, All Nodes, All Partitions, All Statuses, and All Features. Below this, a 'Slurm Chat' window is open, showing a welcome message and a list of actions: 'Show me details about sd001' and 'Show me details about c001'. The main content area displays detailed information for node 'sd001'.

Node: sd001	
Name	sd001
Cores	128
CPU Load	0.13%
State	idle
Features	public debug long epyc
Partitions	
Real Memory	515000 MB
Architecture	x86_64
Boot Time	8/8/2024, 1:54:58 PM
Last Busy	8/8/2024, 1:56:22 PM
Operating System	Linux 4.18.0-553.8.1.el8_10.x86_64 #1 SMP Tue Jul 2 17:10:26 UTC 2024
Gres Used	

At the bottom of the chat window, there are buttons for 'Show me details about c001', 'Show me details for job 1234', and 'Give me a basic slatch example'. Below these is a text input field labeled 'Send a message.' with a send button. At the very bottom, there's a '+ New Chat' button and a status bar showing 'Last Updated: 8/8/2024, 4:57:25 PM' and 'Running Jobs: 0 | Pending Jobs: 0'.

Future Roadmap

GitHub Repository

- Open source strategy
- Issue tracking

Administrative Features

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

The screenshot displays the 'Admin Dashboard' with a dark theme. At the top right are links for 'Home' and 'Sign Out'. The main content is divided into two sections: 'Plugins Management' and 'Cluster Capacities'.

Plugins Management
Manage and update plugin settings

- OpenAI Plugin Enabled
The OpenAI Plugin is currently active and running.

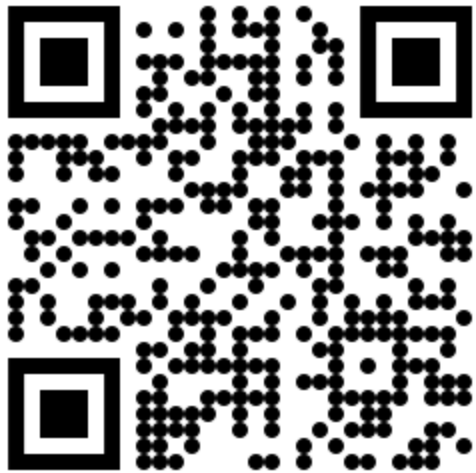
Update Embeddings

Cluster Capacities
Overview of current cluster resources

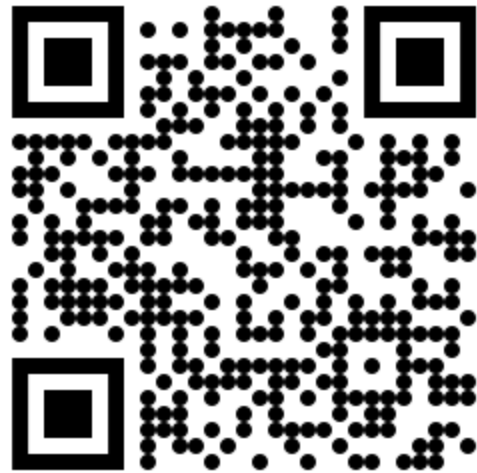
Cluster Status
Cluster resource information is available.

CPU 21,548	MEM 122,771,448	NODE 216
BILLING 59,948	GRES GPU 340	GRES GPU-A100 241
GRES GPU-A30 23	GRES GPU-GH200 2	GRES GPU-H100 12
GRES GPU-L40 14		

Video Demo



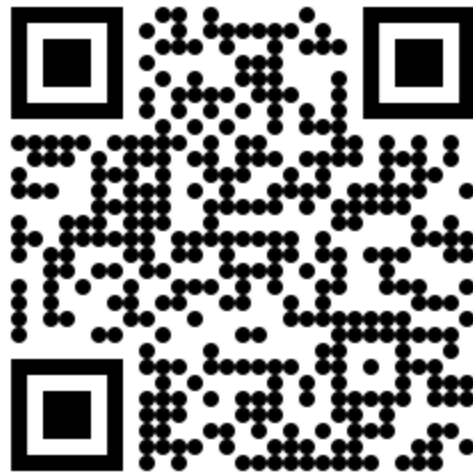
Quickstart



Iframe OOD

Q&A Session

<https://github.com/thediymaker>



@thediymaker.bsky.social

Github