

Frank CI @ University of  
Oregon

[https://oaciss.uoregon.edu/f  
rank](https://oaciss.uoregon.edu/frank)

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# GPU Clusters on Frank

Category Servers - OACISS System X +

https://oaciss.uoregon.edu/frank/

Main Page | Recent changes | Machines | Procedures | Services | Compilers | Software | Visualization | Tools | What links here | Related changes | Special pages | Printable version | Permanent link | Page information



Some relevant pages:

- [Introduction and about <- click me](#)
- The [NetworkInfrastructure](#) page describes the host naming (dns) conventions, as well as documenting the physical setup and connections within the OACISS racks in the machine room. All OACISS systems automatically search .nic.uoregon.edu for DNS, so only the short hostname is needed for ssh internally.
- The [Service:storage](#) describes available storage for users of OACISS systems. OACISS currently has a total of just under 350TB of online storage available.
- The new [HowtoMPI](#) page describes various tested-working MPI setups and the steps

Click on the server links to access more information about individual machines. Note that only the three machines designated as login gateways (orthus, sphinx, cerberus) are accessible by machines outside of nic.uoregon.edu.

**IMPORTANT: Cerberus is in the process of being decommissioned and replaced with a new and much more capable system, Sphinx. Sphinx is the new secondary login node.**

**Nodes in Computing Center datacenter**

Name	Description	OS	Model	Processors	Local Network	Physical location
Compute: Orthus	<a href="#">Primary login gateway</a>	RHEL-8.8	VM	6 x Cascade Lake	10GbE	
Compute: Odyssey	AMD quad MI300A system	RHEL 8.10	SM AS-4145-GT	4 x MI300a, 24cpu	10GbE	R81.U27
Compute: Pinwheel	2xMI210 Debian 12 system	Debian 12	SM AS-2024US-TRT	2 x Epyc Milan 7413	10GbE	R81.U32
Compute: Headroom	Intel Data Center Max 1100 (Ponte Vecchio)	Ubuntu 22	Supermicro	2 x Xeon 4140T @ 3GHz	10GbE	R82.U8
Compute: Hopper1/2	NVIDIA Grace-Hopper GH200	RHELI 9.3	Quanta S74G-2U	Grace (72c)+GH200 Hopper GPU @ 3.4GHz	10GbE + Connect X-7 200 Gbps (pt2pt w/ hopper1/2.eth)	R81.U33-36
Compute: Grace1/2	NVIDIA Grace-Grace	Ubuntu 22.04 LTS	Supermicro ARS-221GL-NR01 (x2)	Grace-Grace (144c) Superchip @ 3.4GHz	10GbE + EDR 100 Gbps (pt2pt w/grace1/2)	R81.U4-8
Compute: Godzilla	Broadwell + RTX6000 Blackwell Server	RHEL 8.10	Broadwell GPU server	2 x 14c Xeon E5-2680v4 @ 2.3GHz	40GbE + EDR	R85.U6
Compute: Roberta	HPE CPE Epyc Genoa	RHEL 8.10	DL385 gen 11	2 x Epyc 9654 Genoa 96c @ 2.4GHz	10GbE + NDR 400 Gbps (pt2pt w/roberta)	R82.U6
Compute: Gary	HPE CPE Epyc Genoa	RHEL 8.10	DL345 gen 11	Epyc 9124 Genoa 16c @ 3GHz	10GbE + NDR 400 Gbps (pt2pt w/roberta)	R82.U4
Compute: Picard	Alipa Sapphire Rapids + 2 A2000	RHEL 8.10	R283-S91	2 x 32c Xeon 6430 @ 3.4GHz	100GbE	R82.U6
Compute: Athena	4xA100 nvlink box	RHEL 8.10	Gigabyte RS292	2 x Epyc Milan 7763 5	10GbE	R85.U39
Compute: Ilyiad	AMD + 1 H100 (80GB) + 2 MI210	RHEL 8.10	Preproduction SuperMicro	2 x 64c Epyc Milan @ 2.8GHz	100GbE + 400G IB	R85.U22
Compute: Gilgamesh	AMD + 1 H100 (80GB) + 2 MI210	RHEL 8.10	Preproduction SuperMicro	2 x 24c Epyc Milan 7413 @ 2.6GHz	100GbE + 400G IB	R85.U26
Compute: Jupiter	Quad Cooper lake + Intel DG1	Ubuntu 22.04.4	Supermicro Sys-240	4 x 24c Xeon Gold 6438 @ 2.3GHz	100GbE + EDR	R86.U10
Compute: Saturn	Quad Ice lake + A100 (80GB) + 2 A100 (40GB)	Ubuntu 22.04.4	Gigabyte RS292-4S1	4 x 26c Xeon Platinum 8367HC @ 3.2GHz	100GbE + EDR	R86.U10



# Frank System – Hardware Diversity

macOS/Darwin arm64

Linux arm64 w/ NVIDIA GPU

Linux x86\_64 w/ NVIDIA, AMD, and Intel GPU

Linux power10, power9 w/ NVIDIA GPU

NVIDIA:  
RTX 6000 Blackwell Server,  
RTX5080, GB10, H100,  
GH200, A100, V100, P100

AMD:  
MI300A, MI210, MI100

INTEL:  
B580, Data Center Max  
1100, A770, DG1



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# Frank Usage

<https://stats.e4s.io>

## GPU Usage, UO, Last Week

GPU Type	# Jobs
AMD MI100	163
AMD MI210	25
AMD MI300A	81
AMD MI50	16
INTEL A770	136
INTEL DATA CENTER MAX 1100	236
INTEL DG1	28
NVIDIA A100	74
NVIDIA A2000	14
NVIDIA GH200	71
NVIDIA H100	21
NVIDIA RTX5080	71



# Trilinos Nightly Builds – An Example Use Case

In master  
Scheduled latest branch ⚙ 13 jobs ⏲ 23 minutes 37 seconds, queued for 2 seconds

Pipeline Jobs 13 Tests 0

Group jobs by Stage Job dependencies

**NVIDIA**

Prep	1-NVIDIA GPU
Repo-Sync	NVIDIA-A100
	NVIDIA-A2000
	NVIDIA-GH200
	NVIDIA-H100
	NVIDIA-RTX5080

**AMD**

2-AMD GPU
AMD-MI50
AMD-MI100
AMD-MI210
AMD-MI300a

**INTEL**

3-INTEL GPU
INTEL-A770
INTEL-DATA-CENTER-MAX-1100
INTEL-DG1

<https://gitlab.e4s.io/uo-public/trilinos>  
Pipeline from February 10

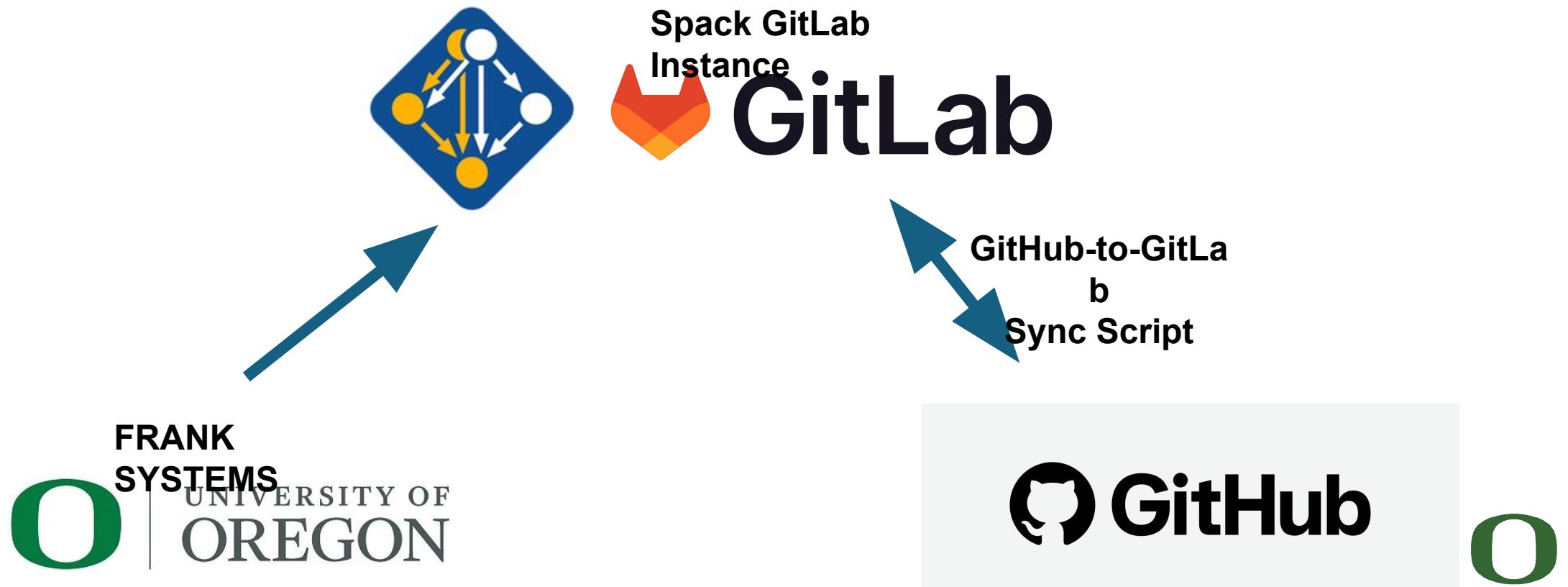


# Accessing Frank for CI Jobs – GitLab Integration

- GitLab Runners on individual Frank nodes
- GitLab Runners registered with gitlab.spack.io, gitlab.e4s.io
- Docker Executor for reproducibility and isolation
- GPUs exposed via GitLab config.toml settings
- Runners are tagged for appropriate job routing
  - Example tags: hpsf-gpu, nvidia-rtx5080, nvidia-h100, amd-mi300, etc...



# Accessing Frank for CI Jobs – GitLab Integration



# NVIDIA GPU GitLab Runner Snippet

The screenshot shows the GitLab Runner configuration page with the following details:

**Tags:** hpsf-gpu, x86\_64-nvidiagpu

**Metrics:**

- Online: 9 ●
- Offline: 0 ○
- Stale: 0 ⓘ
- Upgrade available: 0 ⚡
- Upgrade recommended: 9 ⓘ

**Runners:**

- #183835 (jDdbp48C)** (88 Instance)
  - Owner: Administrator
  - Status: Online (Active)
  - Version: 18.2.1 · heimdall-nvidia-rtx5080-0
  - Last contact: 54 seconds ago
  - Created by luke 11 months ago
  - Tags: heimdall, uo-gpu, x86\_64-nvidiagpu, linux-6.8, hpsf-gpu, nvidia-rtx5080, cuda120, nvidia-575.57.08
- #183715 (JgPUjyKm)** (88 Instance)
  - Owner: Administrator
  - Status: Online (Idle)
  - Version: 18.6.2 · illyad-nvidia-h100-0
  - Last contact: 23 minutes ago
  - Created by luke 11 months ago
  - Tags: illyad, uo-gpu, cuda90, x86\_64-nvidiagpu, nvidia-h100, linux-4.18, hpsf-gpu, nvidia-580.65.06

Two green arrows point from labels to specific runner details:

- A green arrow points from the **NVIDIA RTX5080** label to the first runner's version information.
- A green arrow points from the **NVIDIA H100** label to the second runner's version information.



# AMD GPU GitLab Runner Snippet

The screenshot shows a list of GitLab runners. At the top, there is a search bar with filters: 'Tags = hpsf-gpu' and 'Tags = amdgpu'. Below the search bar, runner statistics are displayed: Online (3), Offline (0), Stale (0), Upgrade available (0), and Upgrade recommended (3). The main list contains two entries:

- AMD MI300A**
  - Status: Online (Active)
  - Runner configuration: #180570 (TVN88wPR1) (88 Instance)
    - Version: 18.6.6 · odyssey-amd-mi300-0
    - Last contact: 56 seconds ago
    - Created by: luke Nov 26, 2024
    - Tags: uo-gpu, x86\_64-amdgpu, amdgpu-6.2, odyssey, gfx942, amd-mi300, linux-4.18, hpsf-gpu
  - Owner: Administrator
  - Actions: Edit, Stop, Delete

A green arrow points from the 'Owner' label to the 'Administrator' role.

- AMD MI100**
  - Status: Online (Active)
  - Runner configuration: #84531 (zT1fd1W2) (88 Instance)
    - Version: 18.7.1 · instinct-amd-mi100-0
    - Last contact: 22 seconds ago
    - Created by: luke Sep 30, 2024
    - Tags: instinct, uo-gpu, x86\_64-amdgpu, amd-mi100, gfx908, linux-5.15, hpsf-gpu
  - Owner: Administrator
  - Actions: Edit, Stop, Delete

A green arrow points from the 'Owner' label to the 'Administrator' role.



Tags = aarch64-macos X

Created date ↓

Online 18 ● Offline 0 ○ Stale 0 ⓘ Upgrade available 0 ⬆ Upgrade recommended 0 ⬆

macOS arm64 hardware  
18 distinct runners online

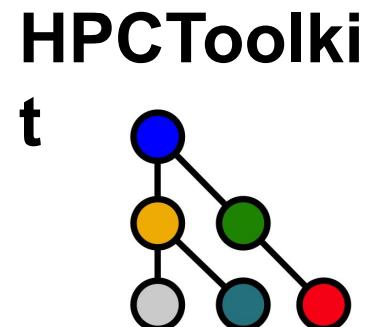
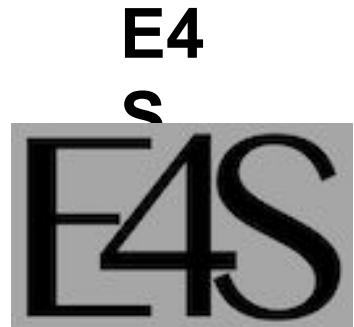
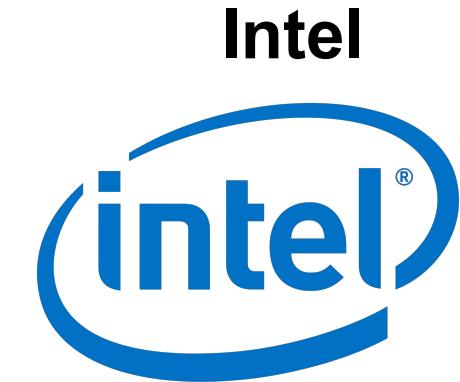
<input type="checkbox"/>	Status	Runner configuration <a href="#">?</a>	Owner <a href="#">?</a>	
<input type="checkbox"/>	<span>● Online</span> <span>Idle</span>	#186872 (m6z2ljCn) 88 Instance Version 18.8.0 · <a href="#">uo-uppsilon-3</a> 🕒 7 Last contact: 28 seconds ago 📅 10.0.0.82 🕒 Created by luke 18 hours ago <a href="#">public</a> <a href="#">spack</a> <a href="#">small</a> <a href="#">uo</a> <a href="#">shell</a> <a href="#">aarch64-macos</a> <a href="#">m2</a> <a href="#">upsilon</a> <a href="#">macos-tahoe</a> <a href="#">apple-clang-17</a> <a href="#">uo-uppsilon-3</a>	Administrator	<a href="#"></a> <a href="#"></a> <a href="#"></a>
<input type="checkbox"/>	<span>● Online</span> <span>Idle</span>	#186871 (tuW1rOEK) 88 Instance Version 18.8.0 · <a href="#">uo-uppsilon-2</a> 🕒 9 Last contact: 28 seconds ago 📅 10.0.51.253 🕒 Created by luke 18 hours ago <a href="#">public</a> <a href="#">spack</a> <a href="#">small</a> <a href="#">uo</a> <a href="#">shell</a> <a href="#">aarch64-macos</a> <a href="#">m2</a> <a href="#">upsilon</a> <a href="#">uo-uppsilon-2</a> <a href="#">macos-tahoe</a> <a href="#">apple-clang-17</a>	Administrator	<a href="#"></a> <a href="#"></a> <a href="#"></a>



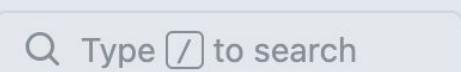
# macOS / Darwin Hardware

- Variety of of ARM64 macOS / Darwin nodes for CI
- M4 Pro x2 (Eta 32gb, Rho 48gb)
- M2 Pro x3 (Kappa 32gb, Upsilon 32gb, Theta 32gb)
- M1 Ultra (Mu 128gb)

# Examples Projects using Frank Hardware for CI



← → C   [github.com/Viskores/viskores/commits/main/](https://github.com/Viskores/viskores/commits/main/) 

Viskores / viskores  ← **Viskores CI Usage**  

Code Issues 20 Pull requests 10 Discussions Actions Projects Models Security Insights

## Commits

main ▾

- o Commits on Feb 3, 2026
  - Merge pull request #250 from vicentebolea ·  vicentebolea authored last week · ✘ 7 / 9
  - add security policy file ·  vicentebolea committed last week · ✓ 8
- o Commits on Feb 1, 2026
  - Merge pull request #237 from kmorel ·  kmorel authored last week · ✓ 8 / 9
- o Commits on Jan 31, 2026

All checks have passed  
8 successful and 1 skipped checks

- ✓  Frank CI - Pipeline succeeded [Details](#)
- ✓  OLCF Frontier - Pipeline succeeded [Details](#)
- ✓  cdash - Build and test results available on CDash [Details](#)
- ✓  CI / format (push) Successful in 32s [Details](#)
- ✓  external / generate\_statuses (push) Successful in 8s [Details](#)
- ✓  CI / macos (macos-14) (push) Successful in 1m [Details](#)
- ⌚  Doxygen / push (push) Skipped [Details](#)
- ✓  Doxygen / user\_guide (push) Successful in 4m [Details](#)

# Viskores Frank Pipeline

## February 1, 2026

- ✓ ubuntu2004\_gcc9
- ✓ ubuntu2004\_gcc9\_cuda118
- ✓ ubuntu2004\_kokkos37
- ✓ ubuntu2204\_clang11\_cuda122
- ✓ ubuntu2204\_clang12
- ✓ ubuntu2204\_gcc12
- ✓ ubuntu2204\_hip\_kokkos37
- ✓ **ubuntu2204\_hip\_kokkos43**
- ✓ ubuntu2204\_kokkos37\_cuda122
- ✓ ubuntu2404\_gcc13
- ✓ ubuntu2404\_gcc14
- ✓ ubuntu2404\_gcc14\_cuda130

# Job Output: ubuntu2204\_hip\_kokkos43

## Using Instinct AMD MI100 GPU to run CTests

Log timestamps in UTC. Search visible log output

```

6/Build.xml to https://open.cdash.org/submit.php?project=Viskores&File
eName=ubuntu2204_hip_kokkos43__relwithdeinfo%2Bbenchmarks%2Bkokko
s%2Bhip%2Bno_rendering%2Bno_testing%2Bccache__20260201-2016-merge-re
quests__XML__Build.xml&build=relwithdeinfo%2Bbenchmarks%2Bkokkos%2
Bhip%2Bno_rendering%2Bno_testing%2Bccache&site=ubuntu2204_hip_kokkos4
3&stamp=20260201-2016-merge-requests&MD5=190238c078b8dace8f2a9eec38ac
d290 Size: 1182
1198 20:17:32     Uploaded: /builds/viskores/viskores/build/Testing/20260201-2016/Bu
ild.xml
1199 20:17:32     Submission successful
1200 20:17:32     Built submission build_id: 11012004
1201 20:17:32     $ ctest -VV -S .gitlab/ci/ctest_build_notes.cmake
1202 20:17:32     Extra verbosity, turned on.
1203 20:17:32     Reading Script: /builds/viskores/viskores/.gitlab/ci/ctest_build_note
s.cmake
1204 20:17:32     Add coverage exclude regular expressions.
1205 20:17:32     SetCTestConfiguration:SourceDirectory:/builds/viskores/viskores
1206 20:17:32     SetCTestConfiguration:BuildDirectory:/builds/viskores/viskores/build
1207 20:17:32     Run dashboard with to-be-determined model
1208 20:17:32     Source directory: /builds/viskores/viskores
1209 20:17:32     Build directory: /builds/viskores/viskores/build
1210 20:17:32     Reading ctest configuration file: /builds/viskores/viskores/CTestC
onfig.cmake
1211 20:17:32     SetCTestConfigurationFromCMakeVariable:NightlyStartTime:CTEST_NIGHTLY
_START_TIME
1212 20:17:32     SetCTestConfiguration:NightlyStartTime:01:00:00 UTC
1213 20:17:32     SetCTestConfigurationFromCMakeVariable:Site:CTEST_SITE
1214 20:17:32     SetCTestConfiguration:Site:ubuntu2204_hip_kokkos43
1215 20:17:32     SetCTestConfigurationFromCMakeVariable:BuildName:CTEST_BUILD_NAME
1216 20:17:32     SetCTestConfiguration:BuildName:relwithdeinfo+benchmarks+kokkos+hip

```

Duration: 2 minutes 13 seconds

Finished: 1 week ago

Queued: 1 minute 59 seconds

Timeout: 2h (from job) [?](#)

Runner: #84531 (zT1fd1W2) instinct-amd-mi100-0

Source: Push

Tags: gfx908 uo-gpu x86\_64-amdgpu instinct

Commit 08bc14f8 [diff](#)

Merge pull request #237 from kmorel/heck-kokkos-finalize

Pipeline #1409385 ✓ Passed for main



build



### Related jobs

- ✓ almalinux8
- ✓ almalinux8\_sanitizer
- ✓ almalinux8\_vtk\_types
- ✓ docs-continuous

## HPCToolkit Example Pipeline

February 10, 2026

test	
<b>Failed jobs</b>	
<span style="color: red;">✖</span> intel amd64:test:hpsf	1
<span style="color: green;">✓</span> cuda12.0 amd64:test:hpsf	1
<span style="color: green;">✓</span> cuda12.1 amd64:test:hpsf	1
<span style="color: green;">✓</span> cuda12.2 amd64:test:hpsf	1
<span style="color: green;">✓</span> cuda12.4 amd64:test:hpsf	1
<span style="color: green;">✓</span> cuda12.5 amd64:test:hpsf	1
<span style="color: green;">✓</span> 9 ppc64le:test:hpsf	
<span style="color: green;">✓</span> rocm6.3 amd64:test:hpsf	2
<span style="color: green;">✓</span> ubuntu22.04 ppc64le:test:hpsf	
<span style="color: green;">✓</span> ubuntu24.04 ppc64le:test:hpsf	

### Job output: rocm6.3 amd64:test:hpsf: [mi300]

Search visible log output



```

3024 [265/278] Compiling C++ object src/hpcstruct/dotgraph.p/intel_GPUBlock.cpp.o
3025 [266/278] Linking target tests/data/meas/testmeas-small
3026 [267/278] Compiling C++ object src/hpcstruct/dotgraph.p/intel_GPUCodeSource.cpp.o
3027 [268/278] Linking target tests/data/meas/testmeas-divergence
3028 [269/278] Linking target tests/data/meas/testmeas-loops
3029 [270/278] Compiling C++ object src/hpcstruct/dotgraph.p/intel_GPUCFG_Intel.cpp.o
3030 [271/278] Compiling C++ object src/hpcstruct/dotgraph.p/Struct.cpp.o
3031 [272/278] Compiling C++ object src/hpcstruct/dotgraph.p/gpu_CudaCFG.cpp.o
3032 [273/278] Linking target tests/data/meas/testmeas-recursion-cuda
3033 [274/278] Linking target tests/data/meas/testmeas-loops-cuda
3034 [275/278] Linking target subprojects/dyninst-13.0.0/parseThat/parseThat
3035 [276/278] Linking target src/hpctracedump/hpctracedump
3036 [277/278] Linking target src/hpcstruct/dotgraph
3037 [278/278] Linking target src/hpcprof/hpcprof-mpi
3038 INFO: autodetecting backend as ninja
3039 INFO: calculating backend command to run: /usr/bin/ninja
> 3040 Saving cache for successful job 00:03
▼ 3049 Uploading artifacts for successful job 00:01
  3050 Uploading artifacts...
  3051 Uploading artifacts 0 B (0 B/s) tmp/builddir*/meson-logs/testlog.junit.xml: found 1 matching artifact files and directories
  3052 Uploading artifacts 74.71 KB (341.7 KB/s)
  3053 Uploading artifacts as "junit" to coordinator... 201 Created correlation_id=01KH3XWJ6RW3CACGR6RP0TN1JA id=20279332 responseStatus=201 Created token=eyJraWQiO
▼ 3054 Cleaning up project directory and file based variables 00:01
  3055 Job succeeded

```

### Odyssey AMD MI300A Runner

Queued: 1 second

Timeout: 1h (from project)

Runner: #180570 (TVN88wPR)  
odyssey-amd-mi300-0

Source: vvp

Test summary: 323

Tags: hpsf-gpu x86\_64-amdgpu  
amd-mi300

#### Job artifacts

The artifacts will be removed in 2 months

#### Commit 2d62bc89

hpcrun: improve error handling for (unmonitored) threads without thread data (hpctoolkit/hpctoolkit!1433)

Pipeline #1421671 Failed for developer

test

# Spack Package Stacks building on Frank

- Frank hardware heavily used for Spack CI
  - Spack core: spack/spack
  - Spack packages: spack/spack-packages
- macOS and Darwin jobs exclusively run on Frank hardware
- CrayPE jobs historically run exclusively on Frank hardware (Cray stacks currently disabled while systems are maintained)
- Other jobs split between AWS and Frank, ~40-50% run on Frank





Search or go to...

spack / spack-packages / Pipelines / #1421762

0 1 Admin

## spack/spack-packages ml-darwin-aarch64-mps-build pipeline from February 10, 2026

### stage-5

- nvtx@3.2.1 /646kdre4b7xf7zyep5mgmshtuximgz...
- nvtx@3.3.0 / ic2onqy7r3iqhjnl nud5qnvortxdquqt...
- py-aiohappyeyeballs@2.6.1 / khwkiraqxmcybpmpvgvig6msajkj5yeio...
- py-astunparse@1.6.3 /577g4sramvluzrnofjonrc1zb7kcxgxp...
- py-astunparse@1.6.3 / xwpyml7hm24km4knlh2nta5pkwl6h...
- py-beniget@0.4.2.post1 /37dl7atluzsrhuqqi3lavnokdkey7gwu...
- py-beniget@0.4.2.post1 / veaa2fgcijnj3nrwoa5ojjsdiowte3t...
- py-click@8.2.1 /

### stage-6

- py-build@1.2.2 / qnkf3f5smzkb3sftb6tly2tmgrnxj57y...
- py-cligj@0.7.2 / k6abqosseup7kkf42cwh7w2dd5fnx2q6...
- py-grpcio@1.75.0 /3bojxnxtdatbsje4hbjaafibqhdg56ri...
- py-grpcio@1.75.0 / fpr7vo7hgczou2xcjfzmhx6yxuixboho...
- py-lightning-utilities@0.11.2 / bvkagsn5kteczm42xnqfnmdohsehndb2...
- py-markdown-it-py@4.0.0 / ayux32wz4ndxaepsyc4mlcx6p3yanghs...
- py-markdown-it-py@4.0.0 / svebka2a4r6al2zvxg5227wabwlkj3n...
- py-omegaconf@2.3.0 /

### stage-7

- py-cppy@1.3.1 / for2nrbbmirhdb2pf15...
- py-hydra-core@1.3.2 ggzz6vgvrnon77wb3
- py-importlib-resource t6mgrprurryu2zgy32j
- py-meson-python@0 ejsezu4yax7o5ar4c7i...
- py-meson-python@0 kxeaaumblsngijywal
- py-meson-python@0 uiak3yaarawmfoyfpg
- py-pluggy@1.6.0 /5yi4nfhl4k54hbdpt
- py-pluggy@1.6.0 /32i131f16m5e5t5...

## Kappa M2 Ultra Darwin Runner

# py-tensorflow-metadata@1.17.2 / dppsqvgjbgipjczsozrlhpjsdbp6wace Machine Learning MPS

Passed Started 1 hour ago by Spack Bot

Log timestamps in UTC.

Search visible log output



Duration: 5 minutes 20 seconds

Finished: 1 hour ago

Queued: 11 minutes 20 seconds

Timeout: 4h (from job) [?](#)

Runner: #186866 (5iTzrW3) uo-kappa-2

Source: Parent Pipeline

Tags: macos-tahoe apple-clang-17  
aarch64-macos public

Job artifacts [?](#)

The artifacts will be removed in 2 months [?](#)

Keep

Download

Browse

```
1 16:06:30 Running with gitlab-runner 18.8.0 (9ffb4aa0)
2 16:06:30   on uo-kappa-2 5iTzrW3b, system ID: s_000909c387b4
3 16:06:30 Resolving secrets
4 16:06:30 Preparing the "shell" executor
5 16:06:30 Using Shell (bash) executor...
6 16:06:30 Preparing environment
7 16:06:30 Running on U0-2007187...
8 16:06:30 Getting source from Git repository
9 16:06:30 Gitaly correlation ID: 01KH44VR59TKA58JABQRJDB8XF
10 16:06:30 Fetching changes with git depth set to 2...
11 16:06:30 Reinitialized existing Git repository in /Users/gitlab-runner-2/builds/5iTzrW3b/0/spack/spack-packages/.git/
12 16:06:31 Checking out c9ef9d1f as detached HEAD (ref is pr2966_ci-enable-darwi
```

# E4S: Extreme-scale Scientific Software Stack



<https://e4s.io>

## About E4S

- E4S, an HPSF project, is an **ecosystem for science** and a community effort to provide open-source software packages for developing, deploying and running scientific applications on HPC platforms.
- E4S has built a comprehensive, coherent software stack that enables application developers to productively develop highly parallel applications that effectively target diverse exascale architectures.
- E4S provides a curated, Spack based software distribution of 120+ HPC (OpenFOAM, Gromacs, Nek5000, LAMMPS), EDA (e.g., Xyce), and AI/ML packages (e.g., NVIDIA NeMo™, HuggingFace Hub, TensorFlow, PyTorch, OpenCV, TorchBraid, Scikit-Learn, Pandas, JAX, Horovod, LBANN with support for GPUs).
- Base images and full featured containers (with GPU support) and DOE LLVM containers.
- Commercial support for E4S through ParaTools, Inc. for installation, maintaining an issue tracker, and ECP AD engagement.
- E4S for commercial clouds: Adaptive Computing's ODDC with ParaTools Pro for E4S™ image for **AWS, GCP, Azure, OCI**.
- With E4S Spack binary build caches, E4S supports both bare-metal and containerized deployment for GPU based platforms.
  - X86\_64, ppc64le (IBM Power 10), aarch64 (ARM64) with support for GPUs from NVIDIA, AMD, and Intel
  - HPC and AI/ML packages are optimized for GPUs and CPUs.
  - Container images on DockerHub and E4S website of pre-built binaries of ECP ST products.
- e4s-chain-spack.sh to chain two Spack instances allows us to install new packages in home directory and use other tools.
- e4s-cl container launch tool allows binary distribution of applications by swapping MPI in the containerized app w/ system MPI.
- e4s-alc is an à la carte tool to customize container images by adding system and Spack packages to an existing image.

# CI on Frank@UO Powered by E4S and Spack

- E4S provides a variety of containers that may be used by CI projects.
- Custom Spack based containers with support for GPUs.
- <https://e4s.io>
- <https://spack.io>
- <https://gitlab.e4s.io/uo-public/>

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# E4S

The screenshot shows the E4S website homepage. At the top, there's a navigation bar with links for "Use E4S", "Join E4S", "About E4S", and "Contact Us". Below the navigation is a large blue header section with the title "E4S: HPC-AI Software Ecosystem for Science" and a subtitle "Performance-portable libraries & tools for advanced computing". There are three buttons: "News & Events", "Get E4S", and "Quick Start". Below the header, there's a section for community interaction with buttons for "Ask a question (GitHub Discussions)", "Report an issue for this page", and "Propose page edits". A welcome message from the U.S. Department of Energy is present. The main content area features four cards with icons and descriptions: "Performance Portability" (run anywhere), "Curated Ecosystem" (over 140 interoperable libraries), "Reproducible Environments" (deploy via Spack, pre-built containers), and "Continuous Validation" (tested across DOE leadership and cloud platforms). Each card has a "Flip for details" button at the bottom.

E4S - An HPC-AI Software Ecosystem for Science  
Advancing Science through Trusted Software

Use E4S   Join E4S   About E4S   Contact Us

## E4S: HPC-AI Software Ecosystem for Science

Performance-portable libraries & tools for advanced computing

News & Events   Get E4S   Quick Start

Ask a question (GitHub Discussions)   Report an issue for this page   Propose page edits

Welcome to **E4S**, the *HPC-AI Software Ecosystem for Science* — an open-source, community-driven collection of high-quality HPC and AI libraries and tools. E4S is an **Extreme-scale Scientific Software Stack** that enables scientists, developers, and institutions to develop, deploy, and run performance-portable applications across CPUs and GPUs from NVIDIA, AMD, Intel, and Arm. Ready to adapt to new architectures as they emerge.

Supported by the **U.S. Department of Energy (DOE)** and its partners, E4S accelerates scientific innovation on systems ranging from laptops to exascale supercomputers.

**Performance Portability**  
Run anywhere—from laptops to exascale supercomputers using modern GPU and CPU architectures.  
Flip for details

**Curated Ecosystem**  
Over 140 interoperable libraries and tools for HPC and AI workflows, validated for research and production use.  
Flip for details

**Reproducible Environments**  
Deploy via Spack, pre-built containers for Docker, Singularity, and commercial cloud environments.  
Flip for details

**Continuous Validation**  
E4S packages are tested across DOE leadership and cloud platforms for quality and reproducibility.  
Flip for details



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# Trilinos CI at UO using E4S containers

NVIDIA-RTX5080 #407384

gitlab.e4s.io/uo-public/trilinos/-/jobs/407384

Explore Sign in

Project uo-public / Trilinos / Jobs / #407384

NVIDIA-RTX5080

Passed Started 1 day ago by Administrator

Duration: 11 minutes 24 seconds  
Finished: 1 day ago  
Queued: 2 seconds  
Timeout: 6h (from job) [?](#)  
Runner: #400 (VxbUQr48) heimdall-docker-nvidia-rtx5080-trilinos  
Source: Schedule  
Tags: trilinos-nvidia-rtx5080

Job artifacts [?](#)  
These artifacts are the latest. They will not be deleted (even if expired) until newer artifacts are available.

Download Browse

Commit 3d0ea516 [View](#)  
use container images with updated c make invocation

Pipeline #27045 Passed for master [View](#)  
1-NVIDIA GPU

Related jobs

- NVIDIA-A100
- NVIDIA-A2000
- NVIDIA-GH200
- NVIDIA-H100
- NVIDIA-RTX5080

Help

Collapse sidebar

```
1 Running with gitlab-runner 18.2.1 (cc489270)
2 on heimdall-docker-nvidia-rtx5080-trilinos VxbUQr488, system ID: s_706b6f046a2e
3 Preparing the "docker" executor
4 Using docker executor with image ecp4s/trilinos-ci-amd64-cuda12.8.0:2025.05.21.patch-1 ...
5 Using effective pull policy of [if-not-present] for container ecp4s/trilinos-ci-amd64-cuda12.8.0:2025.05.21.patch-1
6 Using docker image sha256:cебf68b2d12c97503c9b6d1d0d5daf3212a69a78c90b09d1b808f5488e472f53 for ecp4s/trilinos-ci-amd64-cuda12.8.0:2025.05.21.patch-1 with digest ecp4s/trilinos-ci-amd64-cuda12.8.0@sha256:3f85442d7d4efbe7232c5a25dff4dd5407fc753bcf893908487a58de2c04a2e5 ...
7 Preparing environment
8 Using effective pull policy of [if-not-present] for container sha256:76a4d4e15c088cd9b3c02795ec8d47b898048e57f4ab4db110624#43b27f9a34
9 Running on runner-vxbuqr488-project-21-concurrent-0 via heimdall...
10 Getting source from Git repository
11 GitLab correlation ID: 01KH3970R45WXG1GNYBA5K8WQY
12 Fetching changes with git depth set to 1...
13 Initialized empty Git repository in /builds/uo-public/trilinos/.git/
14 Created fresh repository.
15 Checking out 3d0ea516 as detached HEAD (ref is master)...
16 Skipping Git submodules setup
17 Downloading artifacts
18 Downloading artifacts for Repo-Sync (407382)...
19 Downloading artifacts from coordinator... ok correlation_id=01KH3972NH3A2XQ746JX2KP1YH host=gitlab.e4s.io id=407382 responseStatus=200 OK token=64_mii2t2
20 Executing "step_script" stage of the job script
21 Using effective pull policy of [if-not-present] for container ecp4s/trilinos-ci-amd64-cuda12.8.0:2025.05.21.patch-1
22 Using docker image sha256:cебf68b2d12c97503c9b6d1d0d5daf3212a69a78c90b09d1b808f5488e472f53 for ecp4s/trilinos-ci-amd64-cuda12.8.0:2025.05.21.patch-1 with digest ecp4s/trilinos-ci-amd64-cuda12.8.0@sha256:3f85442d7d4efbe7232c5a25dff4dd5407fc753bcf893908487a58de2c04a2e5 ...
23 $ . vars.env
24 $ mkdir -p $ARTIFACTS_REL_PATH
25 $ export ARTIFACTS=$(pwd)/$ARTIFACTS_REL_PATH
26 $ export F=$ARTIFACTS/trilinos-commit.txt
27 $ if [[ -r $F && -s $F ]] ; then # collapsed multi-line command
28   $ git -C /ci/Trilinos fetch
29   $ git -C /ci/Trilinos checkout $TRILINOS_COMMIT
30 $ HEAD is now at b29cf9a2cb Tachō: finer control of fences for device kernels (#14892)
```



# Intel PTI-GPU CI at UO using E4S containers

The screenshot shows a GitLab interface for a project named "uo-public / pti-gpu". The "Jobs" tab is selected, displaying the details of a specific job, "Intel B580 - PTI Tools (#407433)". The job status is "Passed" and it was started 10 hours ago by "eugenewalker". The log output shows the following steps:

```
1 Running with gitlab-runner 18.5.0 (bda84871)
2 on mage-docker-intel-b580 IW0qSd_PX, system ID: s_73e9a431e208
3 Preparing the "docker" executor
4 Using Docker executor with image ecpe4s/e4s-oneapi-base-x86_64:v2025.2-1759335800
5 Using effective pull policy of [if-not-present] for container ecpe4s/e4s-oneapi-base-x86_64:v2025.2-1759335800
6 Using locally found image version due to it not present pull policy,
7 Using docker image sha256:0ce15cb86e47a7bd4cc788f79b8a8b1ae0c1f6797d07e9aa71134b2b5994209d for ecpe4s/e4s-oneapi-base-x86_64:v2025.2-1759335800 with digest ecpe4s/e4s-oneapi-base-x86_64@sha256:d86357bc0a416d2b589dfbcfae52c04445b2b2513ec45dc8909e30d30d250989 ...
8 Preparing environment
9 Using effective pull policy of [if-not-present] for container sha256:0a9e47fb2054702fd91b2818b1d3090551e3b8582cef1d6d790d999174f947ae
10 Running on runner-iw0qsdp0-project-57-concurrent-0 via mage...
11 Getting source from Git repository
12 GitLab correlation ID: 81KH5R7XMZR1YBCR6M7HP9XR1Z
13 Fetching changes with git depth set to 20...
14 Reinitialized existing Git repository in /builds/uo-public/pti-gpu/.git/
15 Created fresh repository.
```

<https://gitlab.e4s.io/uo-public/pti-gpu/-/jobs/407433>



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- <https://science.osti.gov/ascr>
- <https://pesoproject.org>
- <https://ascr-step.org>
- <https://hpsf.io>
- <https://www.energy.gov/technologytransitions/sbirstr>

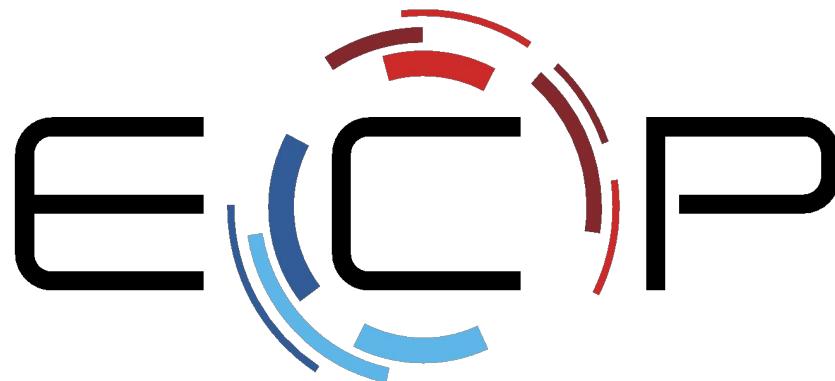
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# Thank you

<https://www.exascaleproject.org>

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EXASCALE COMPUTING PROJECT

**Thank you** to all collaborators in the ECP and broader computational science communities. The work discussed in this presentation represents creative contributions of many people who are passionately working toward next-generation computational science.



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