

SC21 Birds of a Feather

HPC System Testing: Test Suites Content and Availability

ORNL is managed by UT-Battelle, LLC for the US Department of Energy



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Agenda

- Audience Survey on Slido: 5 mins
- Lightning talks on “Test Suites Content and Availability”: 50 mins
 - CSCS site update: Vasileios Karakasis
 - KAUST site update: Bilel Hadri
 - EESI: Caspar van Leeuwen
 - LANL: Francine Lapid & Paul Ferrell
 - ORNL: Verónica G. Melesse Vergara
- Open Q&A with presenters: 10 mins
- Working session to discuss development of a common template: 20 mins
 - Scratchpad: <https://tinyurl.com/hpcSTWGatSC21>
- Defining Next Steps: 5 mins

BOF Goals

- Gain a better understanding of the tests available at each participating center.
- Determine how we can leverage community efforts to augment and improve tests suites.
- Engage the community.
- Establish next steps.

Live Survey

Sli.do in Hubb

Lightning Talk Presenters

- Center updates I:
 - CSCS: Vasileios Karakasis
 - KAUST: Bilel Hadri
- Invited talk
 - ESSI: Caspar van Leeuwen
- Center updates II:
 - LANL: Francine Lapid & Paul Ferrell
 - OLCF: Verónica G. Melesse Vergara

Thank you!

<https://olcf.github.io/hpc-system-test-wg/events/sc21bof>

Comment or send PR:

<https://github.com/olcf/hpc-system-test-wg>

SC21 Birds of a Feather

HPC System Testing: Test Suites Content and Availability

OLCF Update

Verónica G. Melesse Vergara

Group Leader, System Acceptance & User Environment
Oak Ridge Leadership Computing Facility
Oak Ridge National Laboratory

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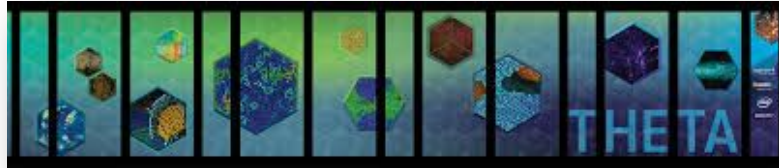


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Outline

- OLCF History
- Acceptance Testing
- Workloads
- Center updates

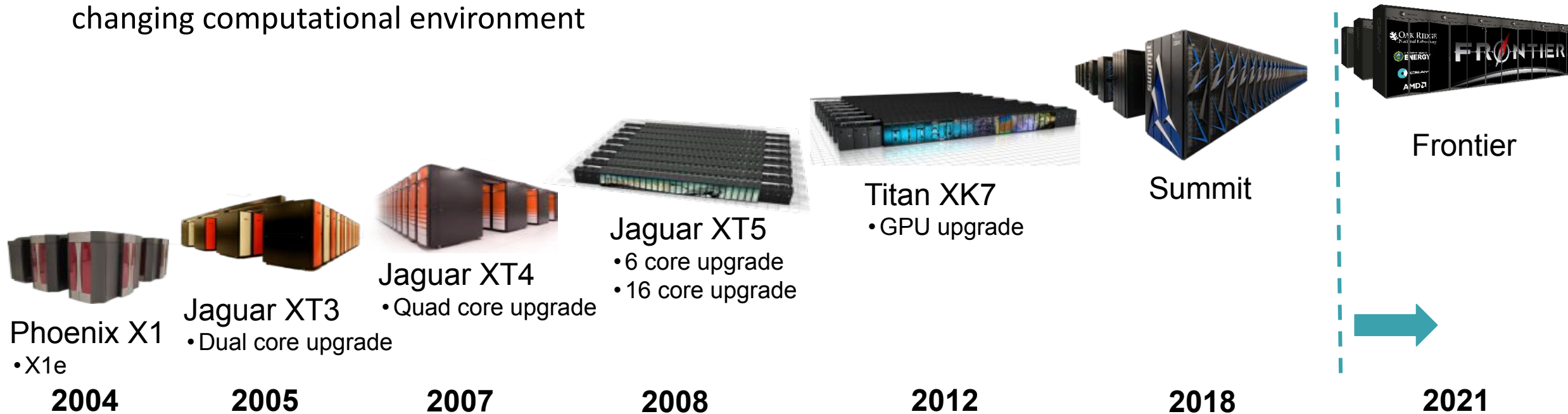
We are one of the DOE's Office of Science computation user facilities



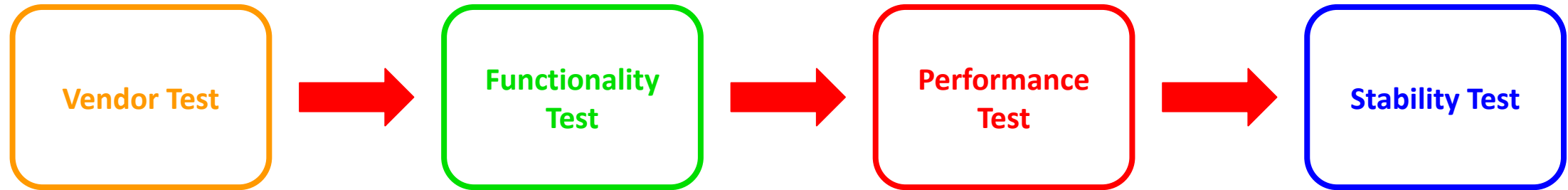
- DOE is leader in open high-performance computing
- Provide the world's most powerful computational tools for open science
- Access is free to researchers who publish
- Boost US competitiveness
- Attract the best and brightest researchers

The OLCF has Successfully Delivered Six Systems Since 2004

- Frontier will be system number seven and will provide an increased capability of over 80,000x
- Large part of success has been strong user partnerships to scale & refactor codes/methods
- Partnering has been essential to delivering science in a rapidly changing computational environment



Acceptance Testing



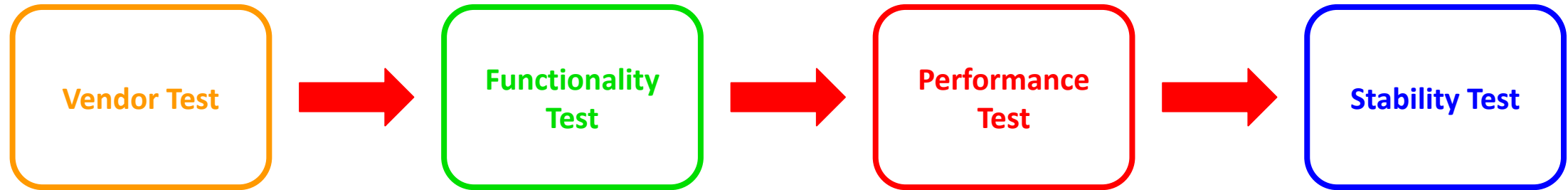
- Installation and deployment of hardware
- Hardware diagnostics

- Component and feature specific testing
- Programming environments

- Scale up specific applications
- Evaluate performance of the system with real application in a dedicated environment
- Measure Figures of Merit

- Simulate a realistic workload
- Simulate code development activities

Acceptance Testing



- Installation and deployment of hardware
- Hardware diagnostics

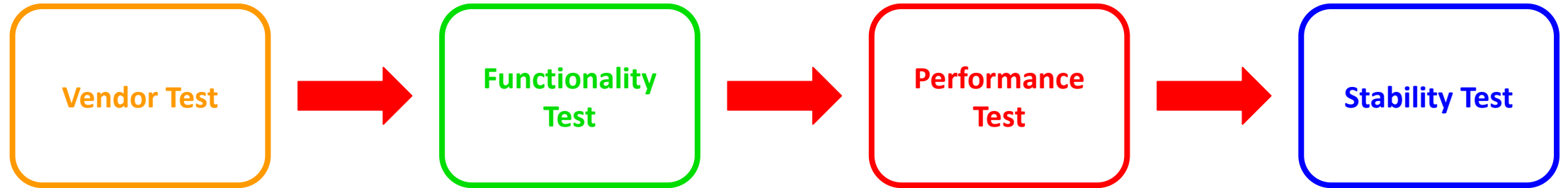
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But how?

Acceptance Testing



- Installation and deployment of hardware
- Hardware diagnostics

- Component and feature specific testing
- Programming environments

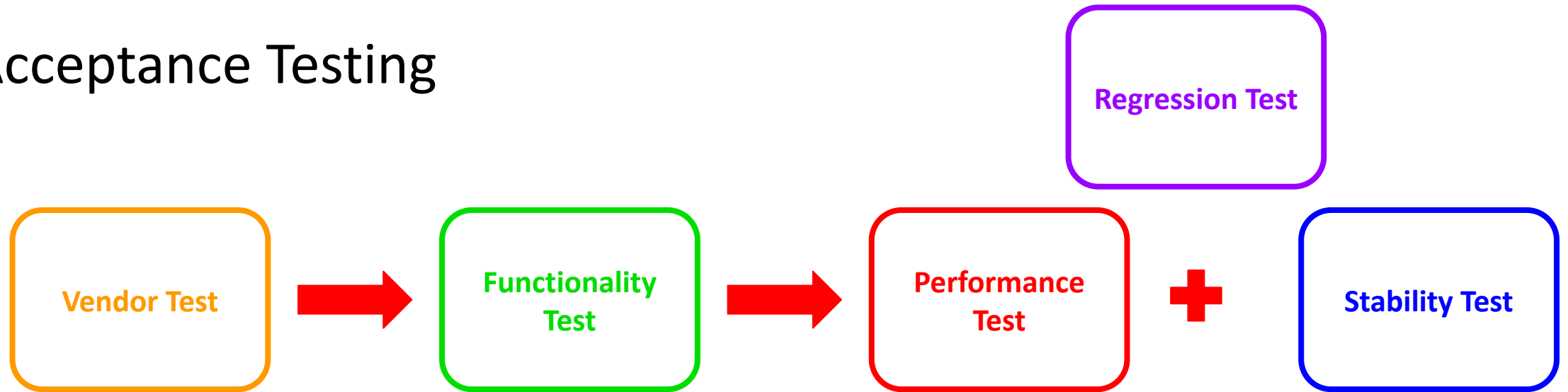
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<http://github.com/olcf/olcf-test-harness>

**OLCF Test
Harness to
the rescue!**

Acceptance Testing



- Installation and deployment of hardware
- Hardware diagnostics

- Component and feature specific testing
- Programming environments

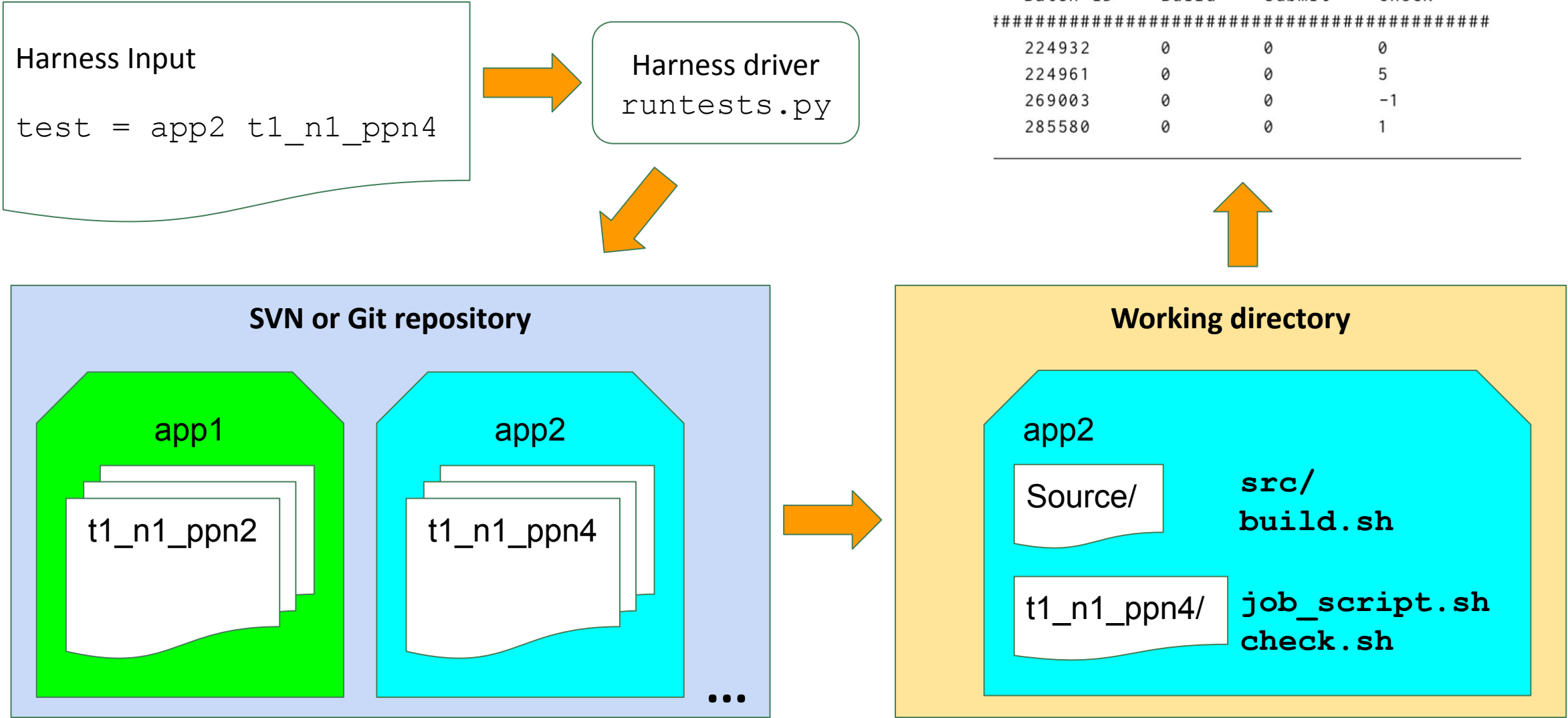
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**OLCF Test
Harness to
the rescue!**

OLCF Test Harness



OLCF Test Harness Dashboard

Harness Dashboard

Jobs

Test Statistics

Application Statistics

Monitors

Filter runs

Filter apps

Filter tests

Filter jobs

Refresh

ID	UID	Batch ID	Run	App	Test	Binary Execute Status	Binary Execute Output	Build Status	Build Output	Submit Status	
4	1626359186.7730727	272545	spock_test	osu_microbenchmarks	test_coll_allgather_2n_2ppn		/gpfs/alpine/stf0... ↗	0		0	0
8	1625854169.6523626	271681	spock_test	osu_microbenchmarks	test_coll_allgather_2n_1ppn		/gpfs/alpine/stf0... ↗	0		0	0
1	1625843430.2373955	271619	spock_test	osu_microbenchmarks	test_coll_allreduce_2n_1ppn		/gpfs/alpine/stf0... ↗	0		0	0
2	1626198020.1172955	272035	spock_test	osu_microbenchmarks	test_coll_allgather_2n_2ppn		/gpfs/alpine/stf0... ↗	0		0	0

Prev

1

2

3

...

6

7

Next

Types of realistic workloads


- Benchmarks
 - contractual, feature specific
- Real-world applications
 - past workloads and expected workloads
- Container technologies
- ML/DL
- Tools
 - Profilers
 - Debuggers
- Workflows

Managing realistic workloads

master summit / summit / +

History Find file Web IDE

Clone

 **add new scriptio application**
Michael Brim authored 2 years ago

f91c12bf

Name	Last commit	Last update
..		
ACME	Using newer ACME repo for harness tests....	3 years ago
ALCF_MPI_Benchmark	ALCF MPI updates.	3 years ago
CORAL-AMG	CORAL-AMG: allows for 30% variability in ...	3 years ago
CORAL-CAM-SE	updates to avoid known failures in ST	3 years ago
CORAL-FTQ	CORAL-FTQ - initial commit	3 years ago
CORAL-HACC-IO	Changing wallclock times	3 years ago
CORAL-HACC	Adding stack trace to HACC test	3 years ago
CORAL-IntegerSort	512 nodes test case.	3 years ago
CORAL-LSMS	add build as a possible build host	3 years ago
CORAL-LULESH	Fixing bug in check scripts for multistep jo...	3 years ago

- Single repo for ALL Summit acceptance tests
- Not “sharing friendly”

Managing realistic workloads

The screenshot displays the GitHub interface for the 'applications' group (ID: 442). The left sidebar shows a list of subgroups under the 'Name' header, including 'ACME', 'ALCF_MPI_Benchmark', 'CORAL-AMG', 'CORAL-CAM-SE', 'CORAL-FTQ', 'CORAL-HACC-IO', 'CORAL-HACC', 'CORAL-IntegerSort', 'CORAL-LSMS', and 'CORAL-LULESH'. The main content area shows the 'Per-Machine Harness Applications Parent Subgroup'. It includes a 'Recent activity (last 90 days)' section with statistics: 0 Merge Requests opened, 0 Issues opened, and 3 Members added. Below this is a 'Subgroups and projects' section with a search bar and a dropdown for 'Last updated'. The list of subgroups and projects includes: 'Cirrus' (Owner), 'spock' (Owner), 'NCRC' (Owner), 'AFW' (Owner), 'andes' (Owner), 'lyra' (Owner, Lyra Tests), 'frontier' (Frontier Tests), 'rhea' (Rhea tests), and 'summit' (Summit Tests). Each entry shows icons for repository, edit, folder, bookmark, and people, along with counts for each.

master

add new script
Michael Brim author

applications Group ID: 442

New subgroup New project

Per-Machine Harness Applications Parent Subgroup

Recent activity (last 90 days)

-	-	3
Merge Requests opened	Issues opened	Members added

Subgroups and projects Shared projects Archived projects Search by name Last updated

> C	Cirrus	Owner				0		11		1
> S	spock	Owner				0		31		8
> N	NCRC	Owner				0		5		3
> A	AFW	Owner				0		14		1
> A	andes	Owner				0		5		1
> L	lyra	Owner				0		29		8
> F	frontier	Frontier Tests			0		34		4	
> R	rhea	Rhea tests			0		2		0	
> S	summit	Summit Tests			0		61		5	

add build as a possible build host 3 years ago


Fixing bug in check scripts for multistep jo... 3 years ago

- Single repo for ALL Summit acceptance tests
- Not sharing-friendly
- Updated OLCF Test Harness to support multiple repos
- Added more flexible features to simplify per system test suites

Managing realistic workloads

master

summit / summit / +



add new scriptio application

Michael Brim authored 2 years ago

Name	Last commit
..	
ACME	Using newer ACME repo for harness
ALCF_MPI_Benchmark	ALCF MPI updates.
CORAL-AMG	CORAL-AMG: allows for 30% variabil
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olcf-system-test > ... > spock

S

spock

Group ID: 505 [Leave group](#)

🔔

New subgroup

New project

Recent activity (last 90 days)

-

Merge Requests opened

-

Issues opened

-

Members added

Subgroups and projects

Shared projects

Archived projects

Search by name

Last updated

L	lammps	0	1 month ago
C	CORAL2-E3SM	0	1 week ago
C	CORAL2-KRIPKE	0	2 weeks ago
O	osu_microbenchmarks	0	5 months ago
P	pennant-hip-test Coral-2 throughput benchmark test for PENNANT	0	7 months ago
C	CORAL2-LAMMPS	0	1 month ago
S	stream-gpu STREAM memory bandwidth benchmark for AMD MI-100 GPU (based on BabelStre...	0	7 months ago
R	rocprof Functionality tests for AMD ROCm rocprof	0	7 months ago
I	IOR	0	7 months ago
G	gpu_aware_mpi	0	7 months ago

OLCF Summary

- Group dedicated to system testing and maintaining the programming environment
 - Regression testing + transition to operation activities
- Deployed version 2.1 of the OLCF Test Harness in Github
 - Added user documentation -- yay!
- Have done a lot of restructuring to make per-system test suites sharing-friendly
- Working to publish Summit, Spock, and (soon) Frontier test suites
- Deployed OLCF Test Harness monitoring for both moderate and open environments

Thank you!

- Acknowledgements:
 - Mike Brim, Wayne Joubert, Arnold Tharrington, Reuben Budiardja, Matt Belhorn, Will Castillo, Dan Dietz, Matt Davis, Jamie Finney, Nick Hagert, Tom Papatheodore, Don Maxwell, Matt Ezell