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CONTAINERS AT SANDIA

(alphabetical)

Anthony Agelastos

Gary Lawson

Kevin Pedretti

Andrew Younge



CONTAINER LANDSCAPE AT SANDIA

Singularity serving current container runtime needs

- Open source, simple images, import from Docker, multiple μ arch, GPU support, large community involvement
- Singularity deployed across Sandia
 - CTS-1 and TLCC clusters
 - Vanguard Astra

Ability to *run* containers on HPC has existed for a few years, but widespread adoption has lagged

- New on-platform container *build* capabilities with Podman & Buildah
- Integrating directly with code teams
- Providing new TOSS and ATSE base container images





PODMAN FOR ON-PLATFORM CONTAINER BUILDS

Need to build containers directly on HPC platforms

- Cannot use Docker due to root-level requirements

Podman and Buildah provide container builds while maintaining user-level permissions

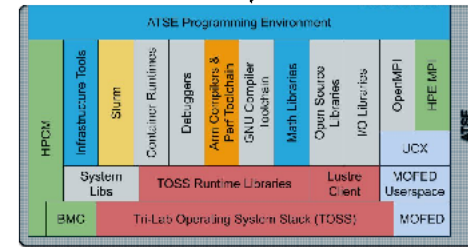
- CLI equivalent to Docker
- User namespaces
- Set uid/gid mappers
- Overlay & FUSE for mounting

Ongoing collaboration with Red Hat

Deployed on Astra/Stria

Planned Podman on CEE servers

```
podman build -t "gitlab.doe.gov/atse/astra:1.2.4" .
```



```
podman push gitlab.doe.gov/atse/astra:1.2.4
```

```
singularity build atse-astra-1.2.4.sif docker://gitlab.doe.gov/atse/astra:1.2.4
```





CONTAINER DEVOPS



Upstream projects can define container environments for systems they don't administer, e.g., ATSE stack to be used on SNL CEE systems.



Running Linux applications on macOS and Windows via Docker enables many engineering workflows while reducing porting burden, e.g., rapid conceptual design tasks where low-fidelity sims help drive CAD designs.



Deploying environment-sensitive, binary-only applications offsite is simplified with containers.



PANEL Q&A #1

What should app teams do to prepare their containers for Exascale?



PANEL Q&A #2

Can container services (eg: Spin, Rancher, Kubernetes) be used to support container builds?

What about monitoring services?



PANEL Q&A #3

What common hiccups or gotchas are seen in building containers?



PANEL Q&A #4

How can we better encourage vendor(s) to better support containerized compilers/tools/PE?

THANKS

