ESPACE ESAP meeting 20220307
Containerization

Stefano's presentation :
https://docs.google.com/presentation/d/e/2PACX-1vQIAOhs1p-RM7XqsXNOqqPeFe6s_KromDwHI5PpcPsl1Kfxud-kTmnEtT5MxXkyg0H3_O5T46a3elHG/pub?start=false&loop=false&delayms=3000#slide=id.p

Stefano's blog : Container engines, runtimes and orchestrators: an overview
https://sarusso.github.io/blog_container_engines_runtimes_orchestrators.html

Q. How many common data formats are there ?
A. OCI Open container initiative is a high level standard
As you go lower down in the layers things become less interioerable.

Q. Will Kata be a better way to run containers on MacOS ?
A. Not yet. If run inside Docker machine it would mean a Kata VM inside a Docker VM/
In the futore we will be able to run containerd on MacOS.
See Lima containers https://github.com/lima-vm/lima

Q Singularity os still the most common on HPC platforms, what are the alternatives ?
A. Drop singularity, use Podman. Singulaity is not a containerization solution, it is a virtual environment. It creates containers with no walls.

Q HPC rejected Docker because Docker has privelige escalation issues
A. There were problems on both sides, Docker (root escalation) and Singularuty (no separation), Podman solves both.

Q So users should not have acces to command line container engine ?
A. Yes, users should invoke containers via an orchestration layer.

Q. Can podman be run entirely from user space ?
A. Yes

Q. Complexity makes sense for services, main use case in HPC is to run applicatiions as a user. Admins create a self contained container to run an application in Does Podman offer similar functionality.
A. If we run containers on behalf of users, Singularity has limitations. Singularity is an environment. Singularity doesn't produce the isolation needed to make it reproducable. Podman provides full isolation, once you create a container it will run the same for all users.

Syntax is identical with Docker, so users can run Docker on your laptop and get the same results as HPC system. Singularity is not portable (filesystem llocations erc.).

Q. What is needed to run Podman ?
A. Installed as an OS package (some issues with NFS home directory).
https://podman.io/getting-started/installation

Q. What issues in migrating HPC environment from Singularity to Podman ?
A Yes, will need to loose the HPC environment specific magic incantations and create a generic environment.

Stefano comment: very accurate transcript, thanks. On the last answer, I actually meant “Singularity black magic” (i.e. MPI works because it uses SSH conf of the host) more than generic “HPC environment specific magic incantations”