Getting started with containers

Apptainer & pipelines

Why apptainer?

On a HPC:

- Users have different **levels** of **priviliges**

- Users **submit jobs** with time/cpu/memory restrictions

These are two things **Docker doesn't facilitate**:

- Requires **superuser** priviliges

- Docker commands are an API of a **daemon** (parentless)

Specific apptainer features

- UID + permissions are inside the container always the same as outside
- No daemon – container is a child process, which also means:
  - Images are files (.sif)
  - Different image format

Two apptainers?

- Since 2021 singularity split:
  - Apptainer (Linux foundation)
  - SingularityCE (Sylabs)

Docker + apptainer

- "Best of both worlds"
- Most bioinformaticians use docker for:
  - Development
  - testing - CI/CD
  - Sharing
- Most bioinformaticians use apptainer for:
  - Deployment on a HPC

```
apptainer pull docker://namespace/image:tag
```

Apptainer without docker

- The apptainer `Dockerfiles`: Apptainer recipies (i.e. definition file)

- **Note**: installing as root inside container requires root privileges outside container!

- Solutions: --fakeroot or build with external runner

Exercises

- Pull your own docker image with apptainer

- Container execution and mounting with apptainer

- Using a biocontainers image to do some bioinformatics