DIRAC deployment on Kubernetes

Natthan Pigoux

Summary

1. Principles of Kubernetes

2. Preparing the K8 configuration for DIRAC services

3. Limitations and CTA outlook

Principles of Kubernetes

"Kubernetes is an open-source system for automating deployment, scaling, and management of containerized applications."

- Containerize service == pod
- Ingress nginx == HTTP load balancer for outside connexions
- Gitlab project which contains the Docker image and Helm charts
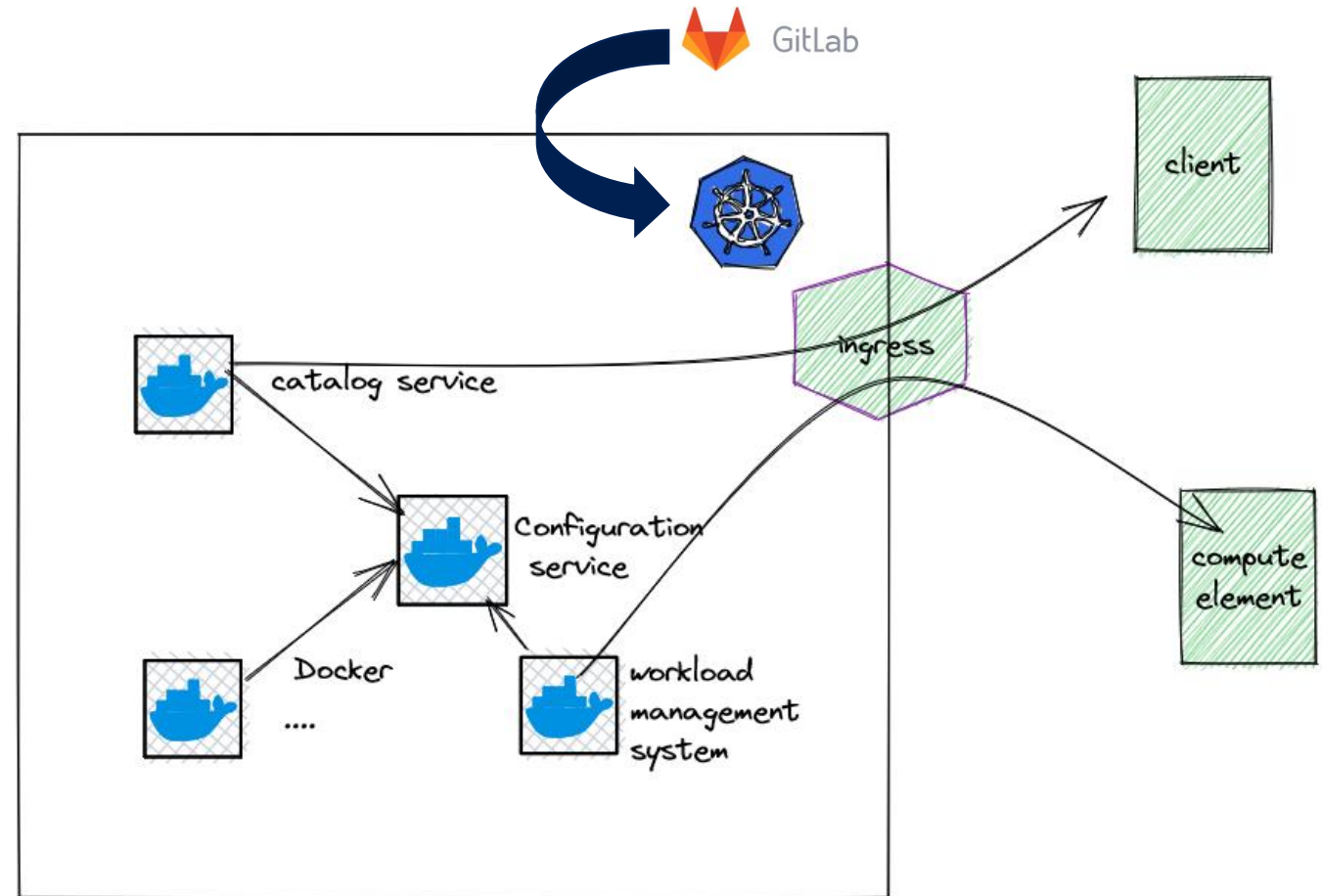
Preparing the K8s configuration

1. ## Container
   - Create a **Dockerfile** with DIRAC (+CTADIRAC) installed + basics necessary packages
   - **Entrypoint** (script executed when running the container) which install a specific component using for example the command **dirac-service**

2. ## (Helm) Charts
   - Each **DIRAC service** can be replicated and described under a Kubernetes deployment => creating one generic **chart file** for all services
   - **Tornado** has its own deployment
   - dirac.cfg, host certificates and keys are kept in **K8s Secrets**
   - In values.yaml we will specify each services we want to install within a **K8s pod**
   - Create an **nginx ingress** to manage outside connexion

DIRAC Limitations

- **Agents** cannot run on Kubernetes due to the tasks queuing framework

=> Update expected ?

- The **logs** of all HTTPS services running are regroup under the Tornado log file

=> Is it possible to separate those logs ?

CTA outlook

CTA has its own K8s cluster at DESY.

RUCIO is already running on the K8s cluster.

CTADIRAC is expected to run on the the K8s cluster (Release 1).