# Compute on Kubernetes

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ESGF
Earth System Grid Federation

# Initial Considerations

Apache MESOS™

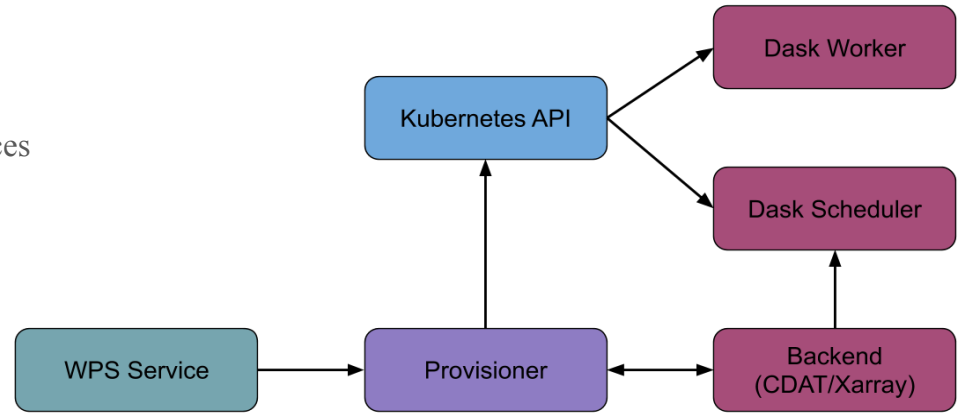
kubernetes

- Microservices
- Containers
- Resource management
  - Dynamic resource allocation
- Container orchestration
  - Docker Swarm, Google Kubernetes, Apache Mesos

docker

# Design

- Provisioner
  - Communicate with Kubernetes API using service account
  - Pass WPS requests to backend
  - Allocates resources requested by backend
  - Monitors/reclaim those resources
- Backend
  - Determines resources
  - Execute compute process on provisioned resources
  - Aggregate, Subset, Max, Min, Subtract, Sum
- Prometheus exporters



# Moving forward

- Kubernetes Operator
  - Compute resources as Custom Resource Definition (CRD)
  - Process management
  - Smart routing process execution w/federated clusters
- Federation
  - Kubernetes Federation v2
  - Istio
    - Service Mesh
- Testing!


kubernetes

# Users

- Custom user processes
- Advanced processes
  - Binning, Resampling
- Ease adoption of WPS
  - Providing notebooks with user use-cases
- Reproducibility

# Access

- JupyterHub
  - Access local data
  - esgf-compute-api remote data
  - Tighter integration
- Python library (esgf-compute-api)

# Thank you