

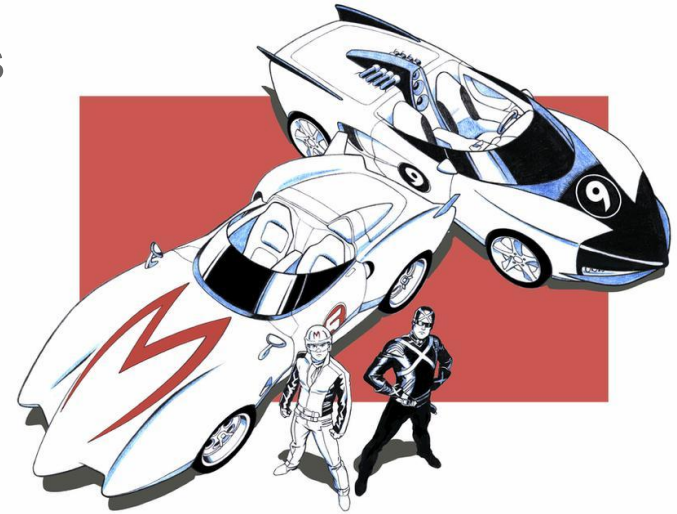
ServiceX and Kubernetes

Interactive Columnar Analysis at Scale



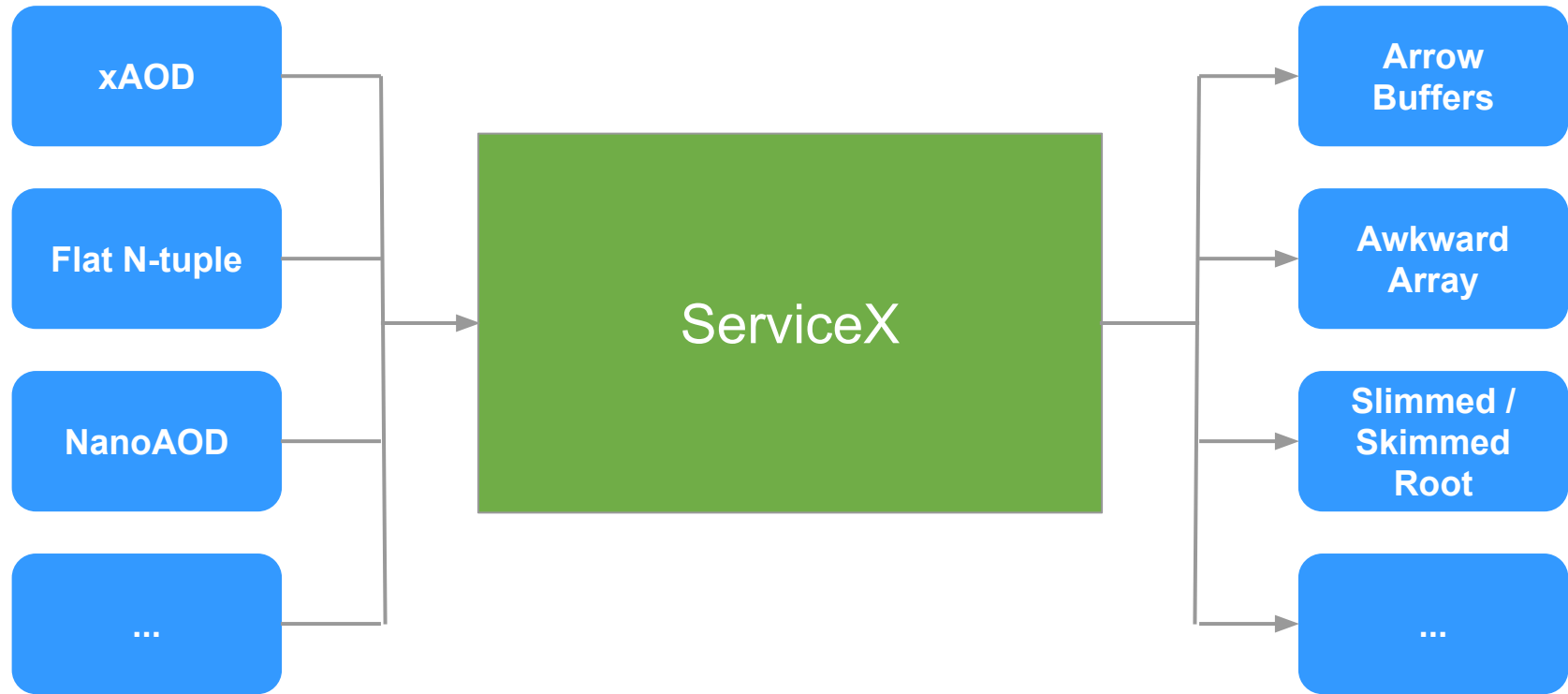
What Does ServiceX Do?

- Converts experiment-specific datasets to columns
- Extracts data from flat ROOT files
- Simple cuts
- Simple derived columns
- Specified fields
- REST Interface
- Autoscales
- Object store results
- Transactional

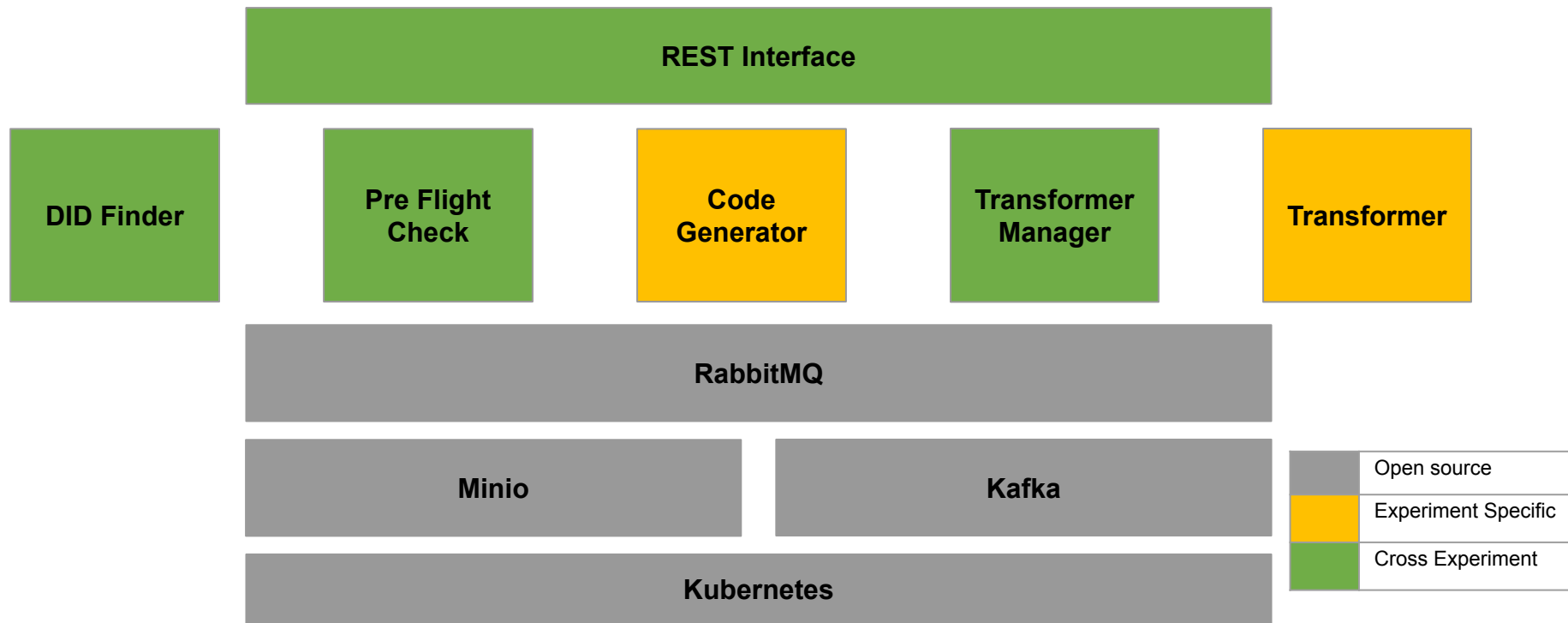


<https://www.deviantart.com/jerome-k-moore/art/SPEED-RACER-and-RACER-X-180431568>

Delivery of columnar data to analysis system



Architecture



Kubernetes Implementation

- Deployments:
 - ServiceX App
 - DID Finder
 - Code Generator
 - Preflight Check
- Secrets
 - X509 Cert and Key
- ConfigMaps
 - Flask Config
 - Generated Code
 - Rucio Config
- Ingress
 - REST Interface
 - Object Store Browser
- Roles:
 - Job Manager
 - Secret Manager
 - ConfigMap Manager

HELM Chart

- Easy to deploy on most Kubernetes Clusters
 - Laptops
 - University of Washington Physics Cluster (Tev)
 - University of Chicago River Cluster
- Extensive customization via [values.yaml](#)
 - Whether to use persistent volumes throughout
 - Rucio preference for local replicas
 - Use autoscaling

Dependent Charts

- RabbitMQ
- MinIO
- Postgres (optional)

Access to Service

- All interactions are via REST
- Gordon Watts' [ServiceX Frontend Library](#)
- Internal to cluster via Service
- Optional JWT Authentication
- Optional external ingress for
 - REST Service
 - Minio Object Store

Next Steps

- CI Build and Test of Helm Chart
- Prometheus Monitoring of Application
- LogStash log mining
- Migrate to GlobusAuth or CERN JWT
- Obtain Service Accounts for CMS and ATLAS

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