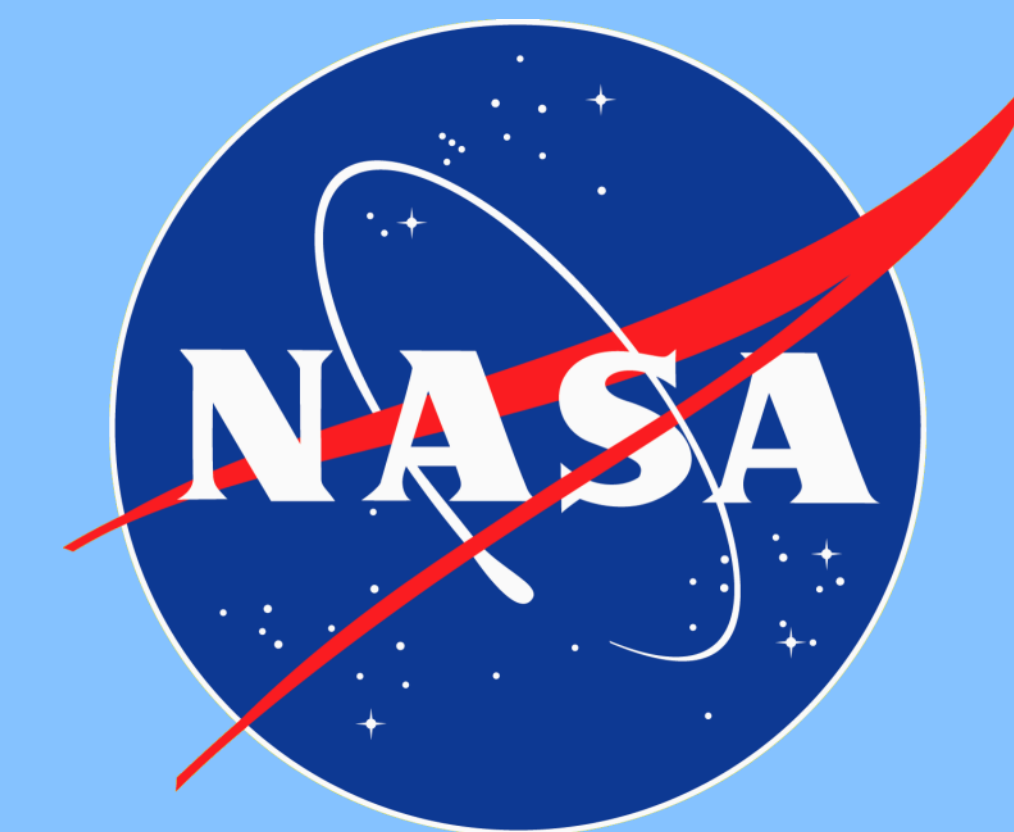




Scaling API-based Microservices in ASDC's On-Premise Cloud Environment for Retrieval of Atmospheric Science Data

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Introduction

The Atmospheric Science Data Center (ASDC) offers Earth Science data sets created from satellite measurements, modeling, and field experiments enabling scientists, educators, and the public to study earth and its atmosphere. NASA ESDIS is working towards making Earth Science data and tools cloud-ready. In an effort to align itself with these efforts, the ASDC is transitioning its existing web based services, tools and applications to RESTful APIs, containerized as microservices to leverage scalability and efficiency of an on-premise cloud environment.

- Containerized web service utilizing ASDC's on-premise cloud environment
- Implementation of data subsetting services for atmospheric data
- Performance metrics (comparison statistics with existing services)
- Technical challenges encountered in transitioning legacy services

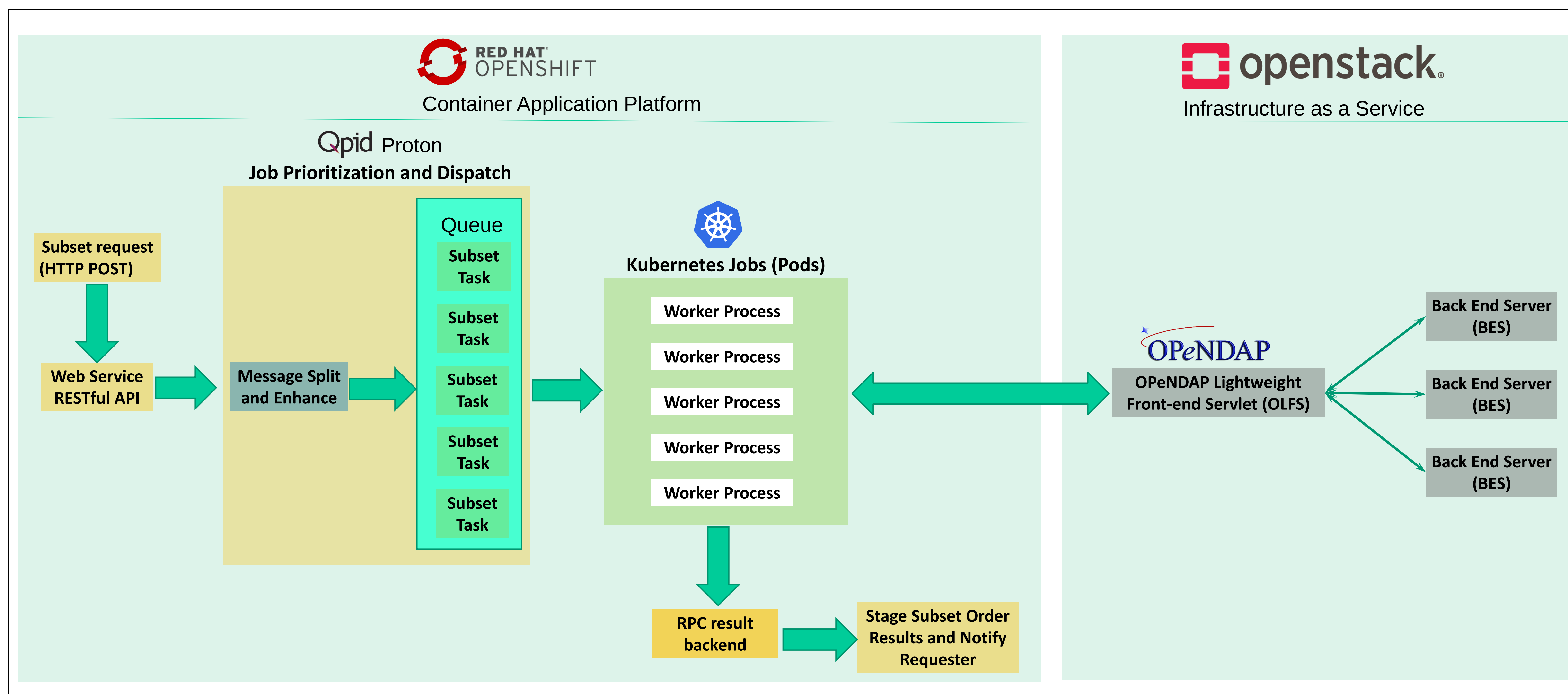
Future Work

- Extend spatial filter capabilities to include vertical dimension subsets
- Research the option of expanding compute resources to the commercial cloud to provide timely responses to very large subset requests.

Refactoring Subsetter Framework to Leverage Workflow Management and Parallelization Features in OpenShift

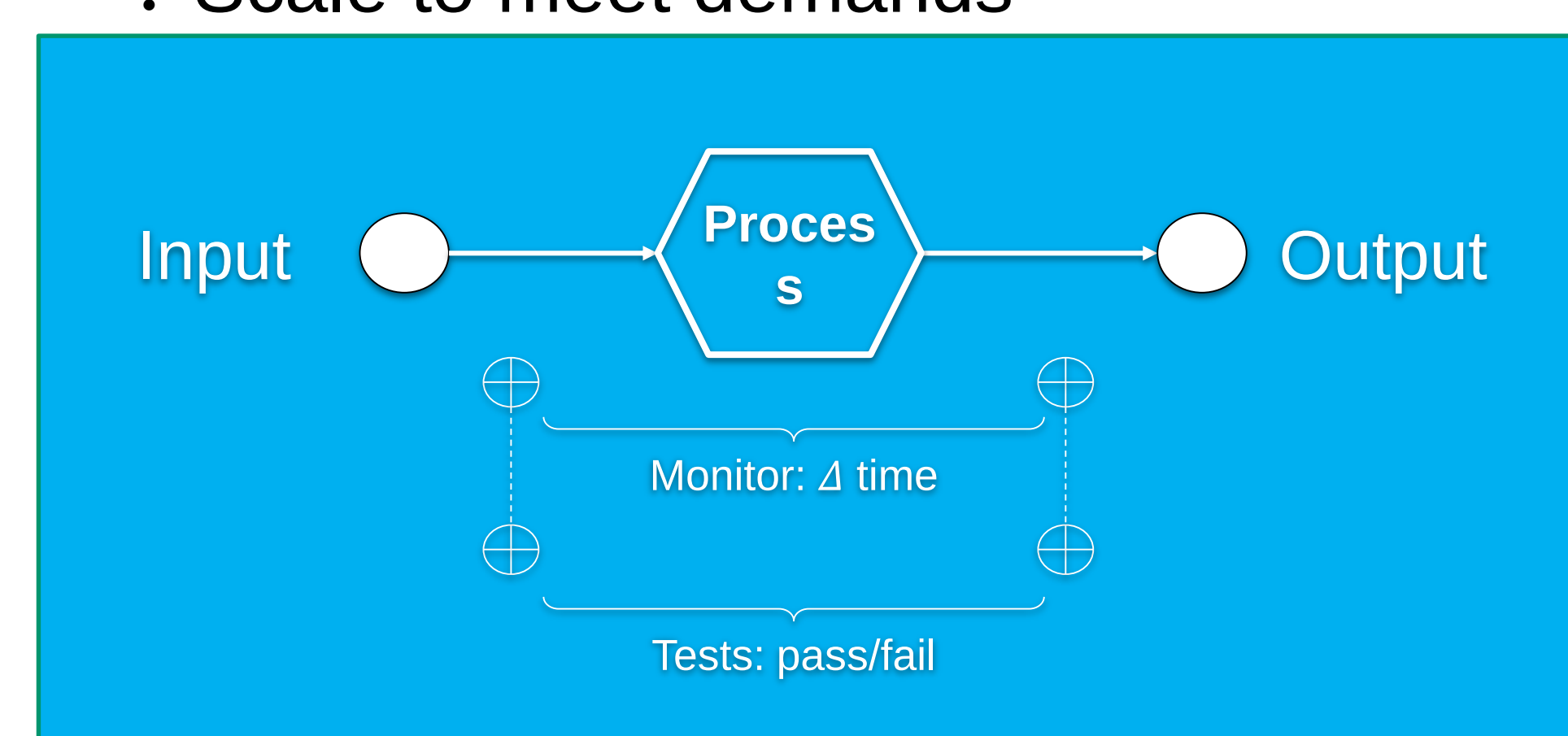
The revised ASDC subsetter framework architecture leverages the functionality of PAAS components in the Red Hat OpenShift. The current (legacy) ASDC subsetter uses a SciFlo Grid Workflow Engine for workflow processing/messaging and Univa Grid Engine for resource management and task scheduling. This new architecture encapsulates the functionality of the original subsetter framework taking advantage of containerization and advanced messaging and auto-scaling capabilities included in the OpenShift suite of services.

Subsetter Framework Architecture



OpenShift: Composable Services

- Common Business Processes
- Loosely Coupled
- Linked together as needed
- Scale to meet demands



Services form a Workflow



Auto-Scale Services based on demand when and where needed

