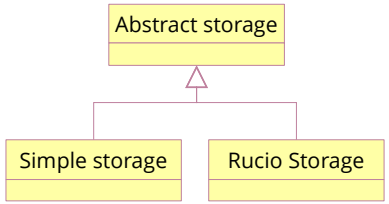
Execution Broker

SP-4643
Progress report

Dave Morris
Manchester
University



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21st November 2024

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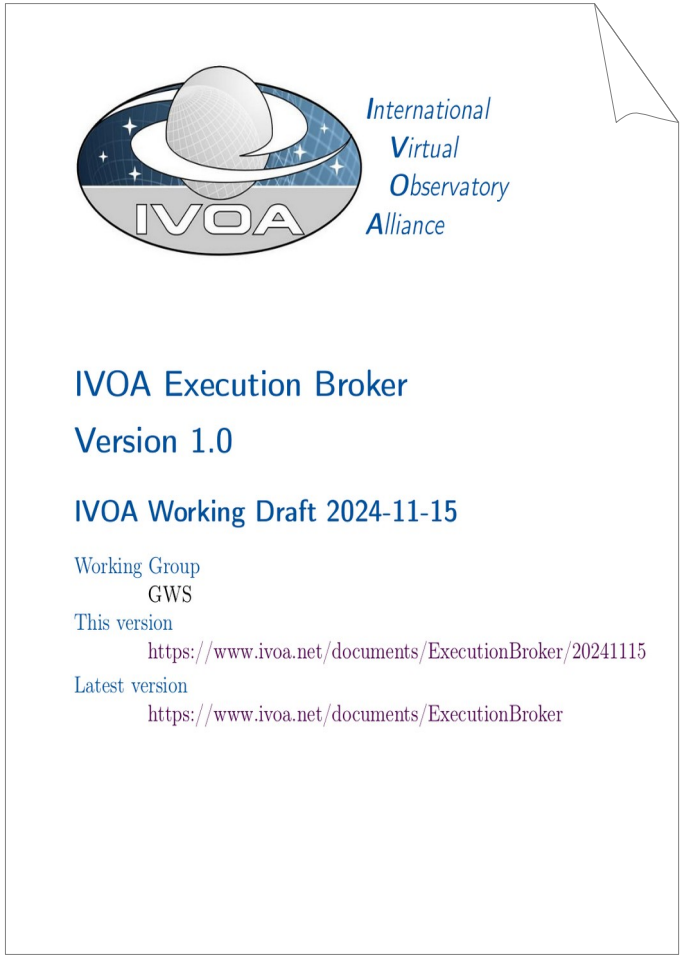
SKAO Regional Centre Network

New standard, new document structure.

The Execution Broker service is based on the following IVOA standards :

- *The IVOA REST service framework*
- *The IVOA structured error messages*
- *The IVOA HTTP protocol profile*
- *The IVOA JSON encoding profile*
- *The IVOA YAML encoding profile*

Unless otherwise stated, the Execution Broker service follows the profiles defined in these standards.


International Virtual Observatory Alliance

IVOA Execution Broker

Version 1.0

IVOA Working Draft 2024-11-15

Working Group
GWS

This version
https://www.ivoa.net/documents/ExecutionBroker/20241115

Latest version
https://www.ivoa.net/documents/ExecutionBroker

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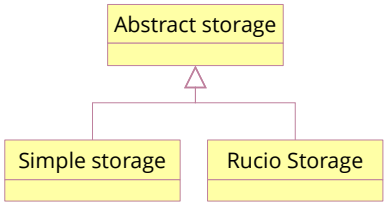
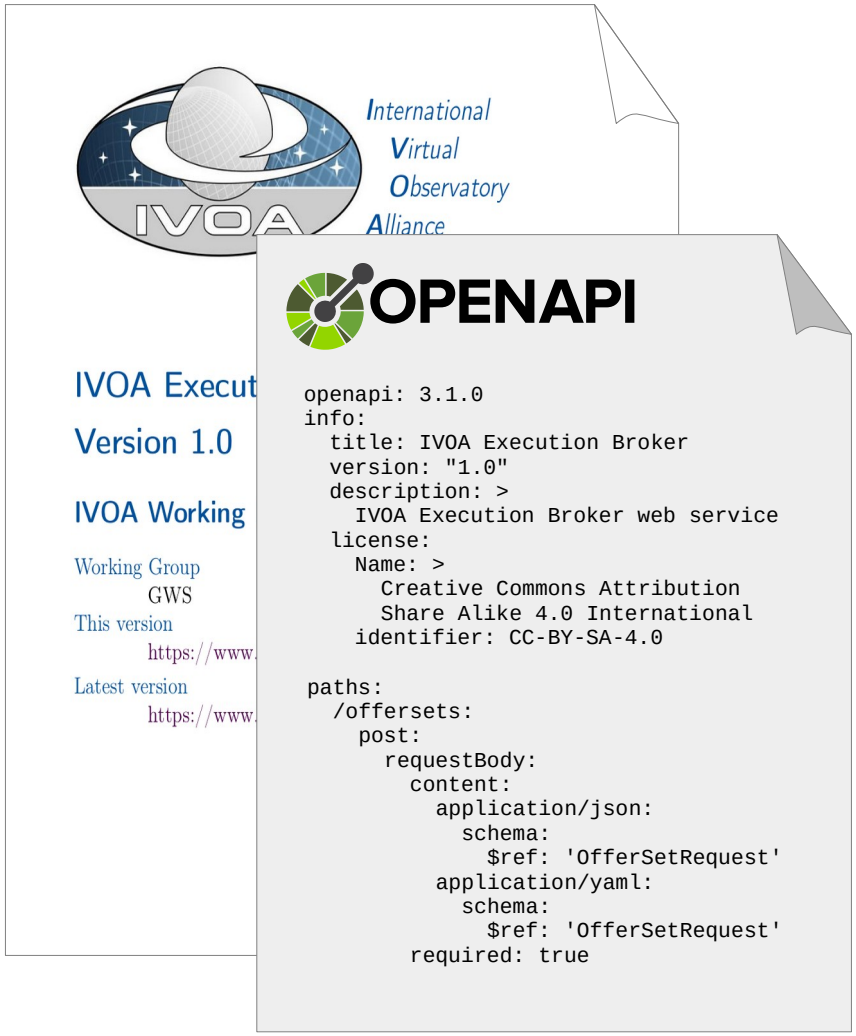
New standard, new document structure.

“This document explains the reasoning behind the design and uses examples to describe the service behavior.”

“The technical details of the data model and web-service API are defined in the OpenAPI specification published alongside this document.”

OPENAPI





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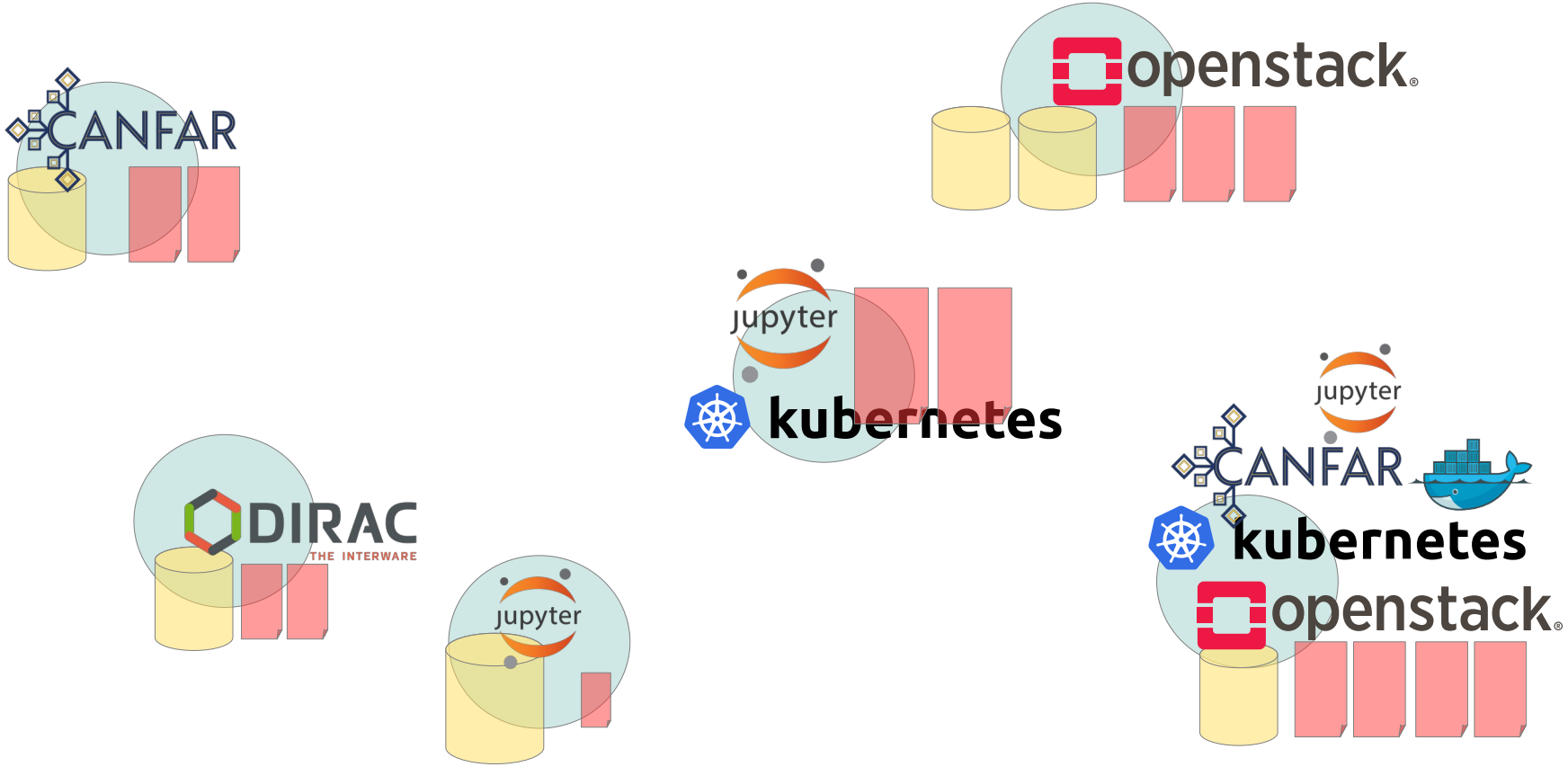
IVOA

The problem

Lots of different execution platforms

Each with their own local capabilities and policies



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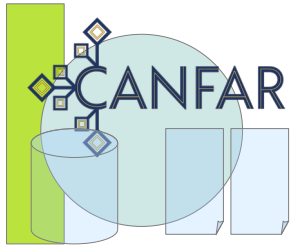
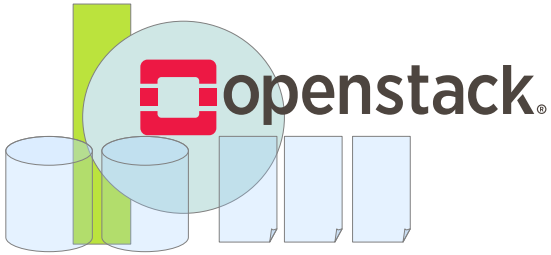
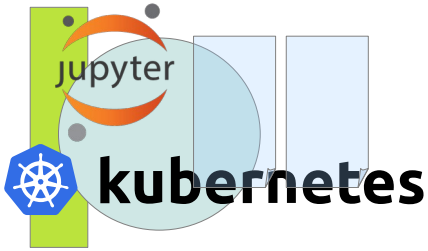
IVOA

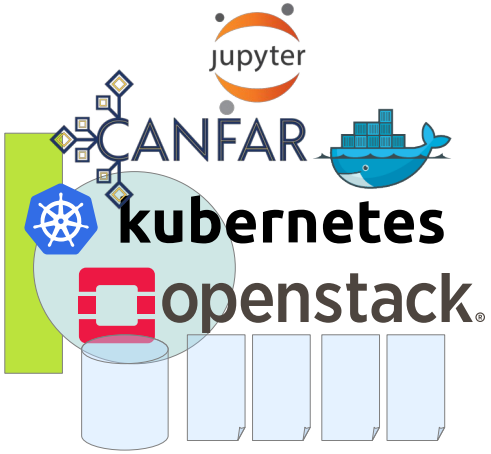
Execution Broker – the service

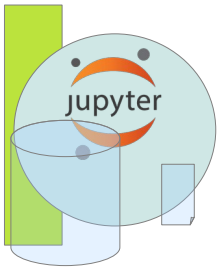
Deploys a common interface for executing things











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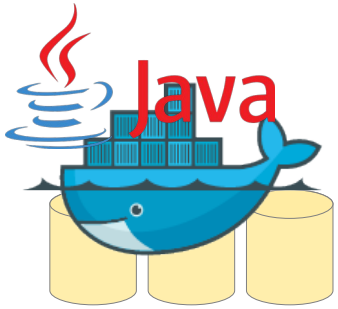
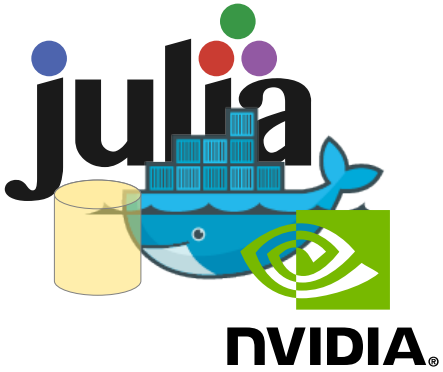
IVOA

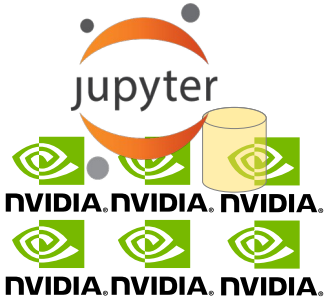
The problem

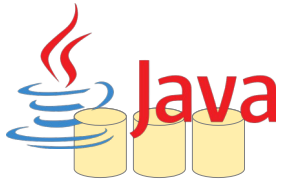
Lots of different types of software

Each with their own requirements and interfaces









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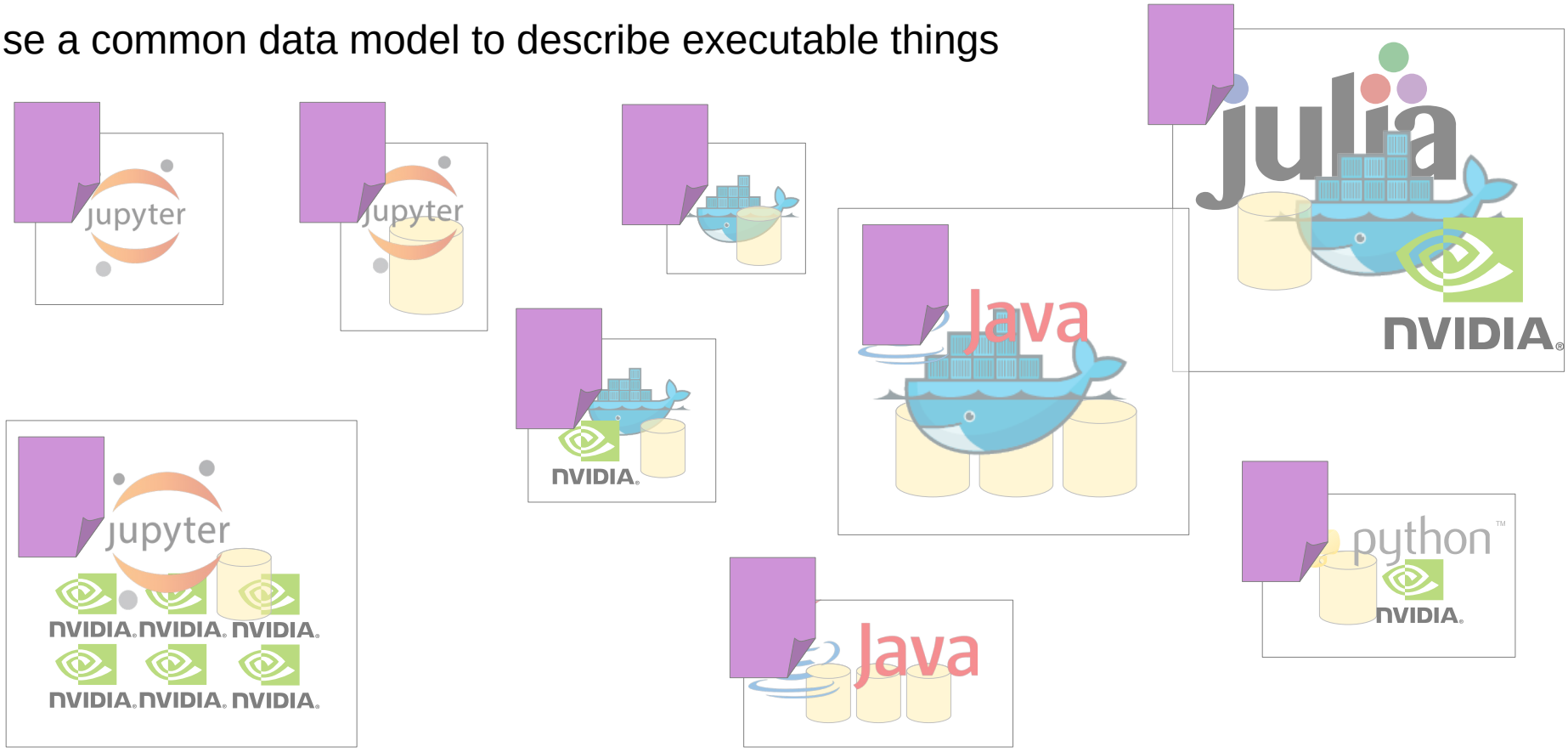
IVOA

Execution Broker – the data model

Use a common data model to describe executable things



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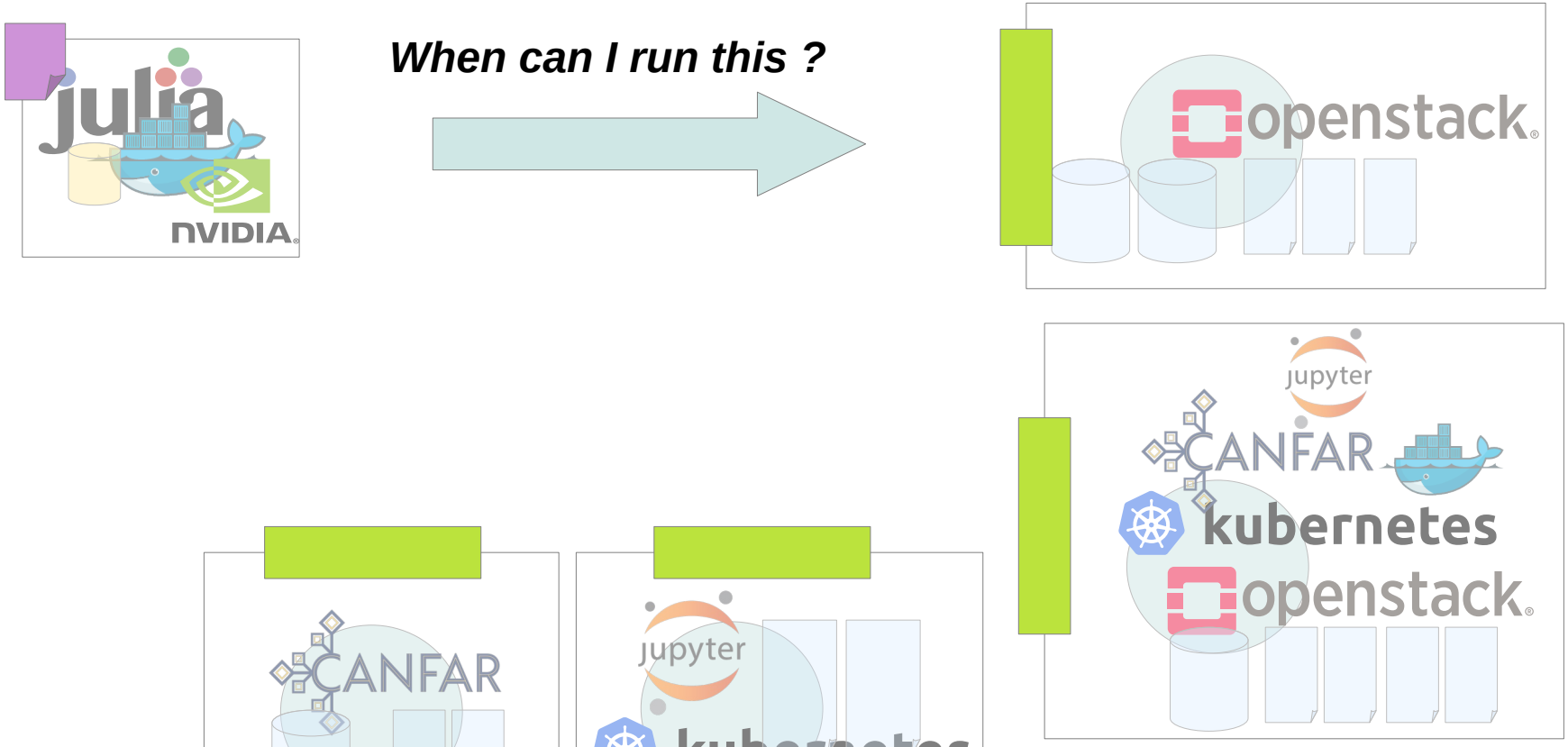
Execution Broker – the solution

Pass a common data-model description to a common interface



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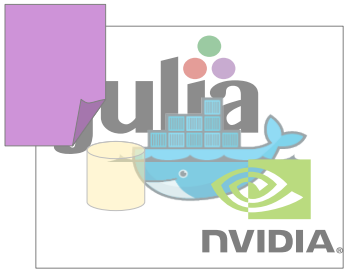
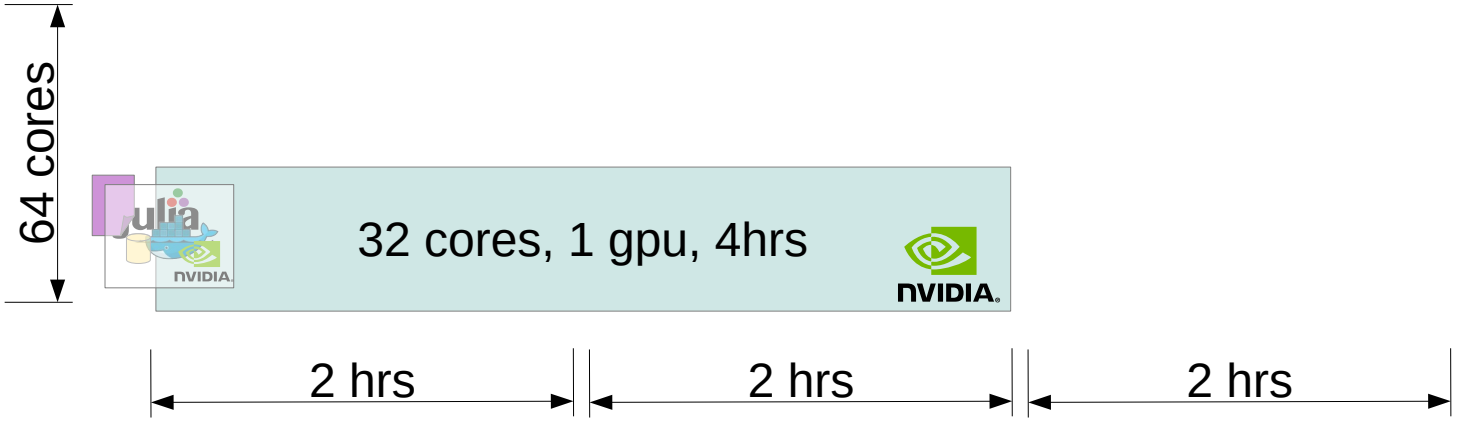
Resource scheduling

When can I run <this> ?



Request for 32 cores and a GPU for 4 hrs



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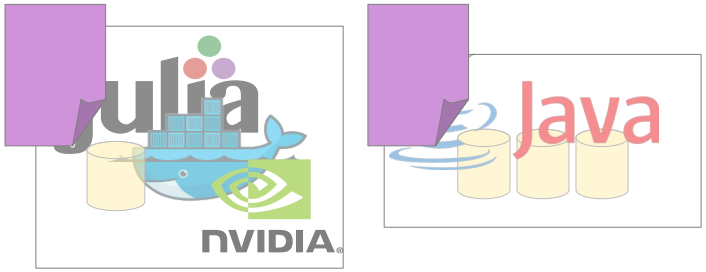
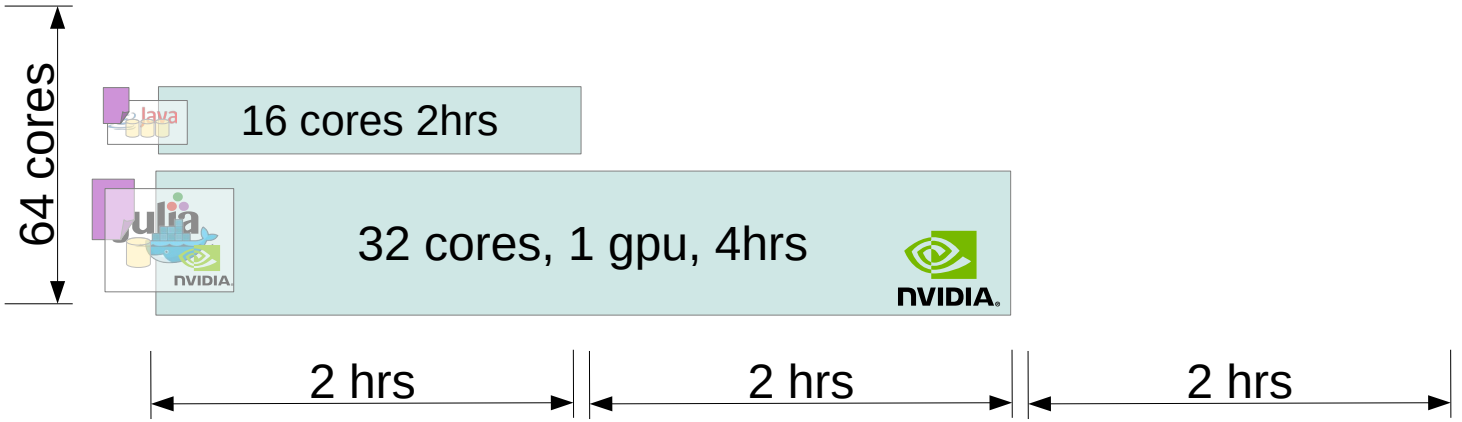
Resource scheduling

When can I run <this> ?



Request for 16 cores 2 hrs



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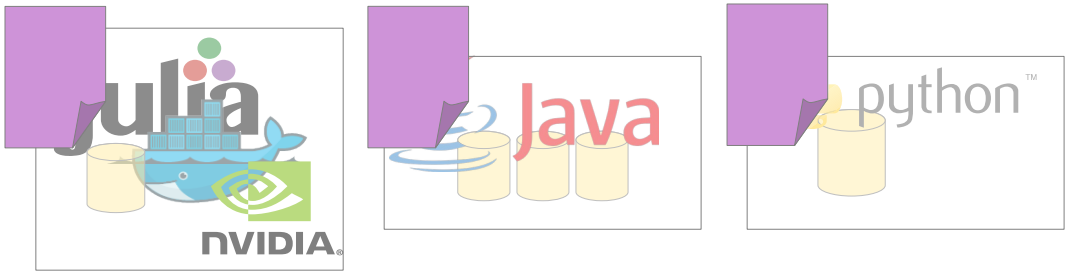
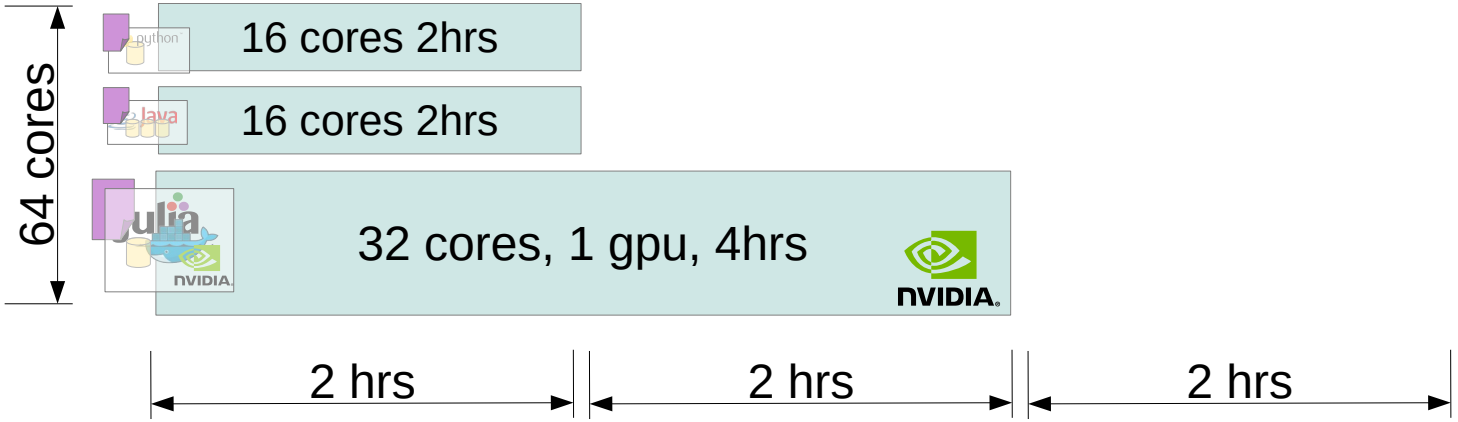
Resource scheduling

When can I run <this> ?



Request for 16 cores 2 hrs



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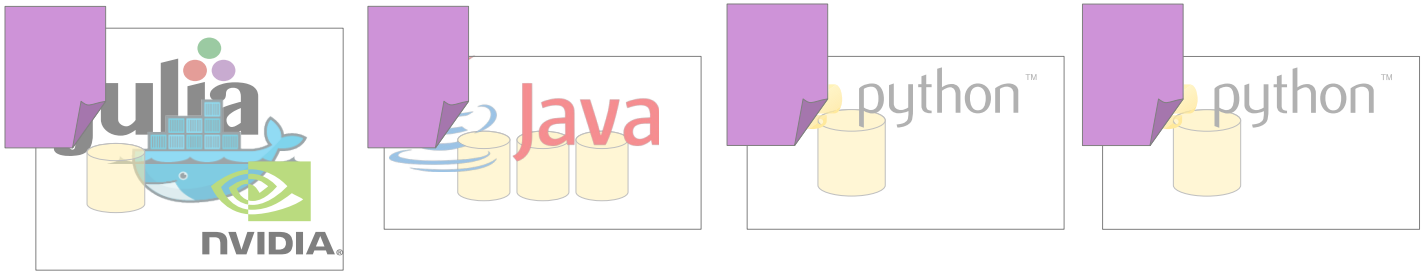
Resource scheduling

When can I run <this> ?



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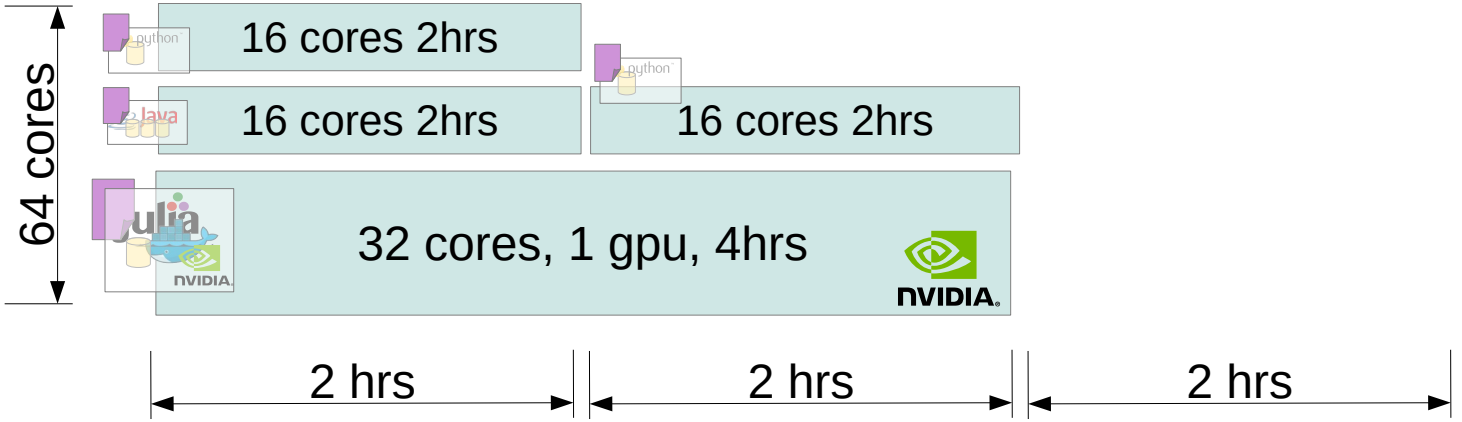

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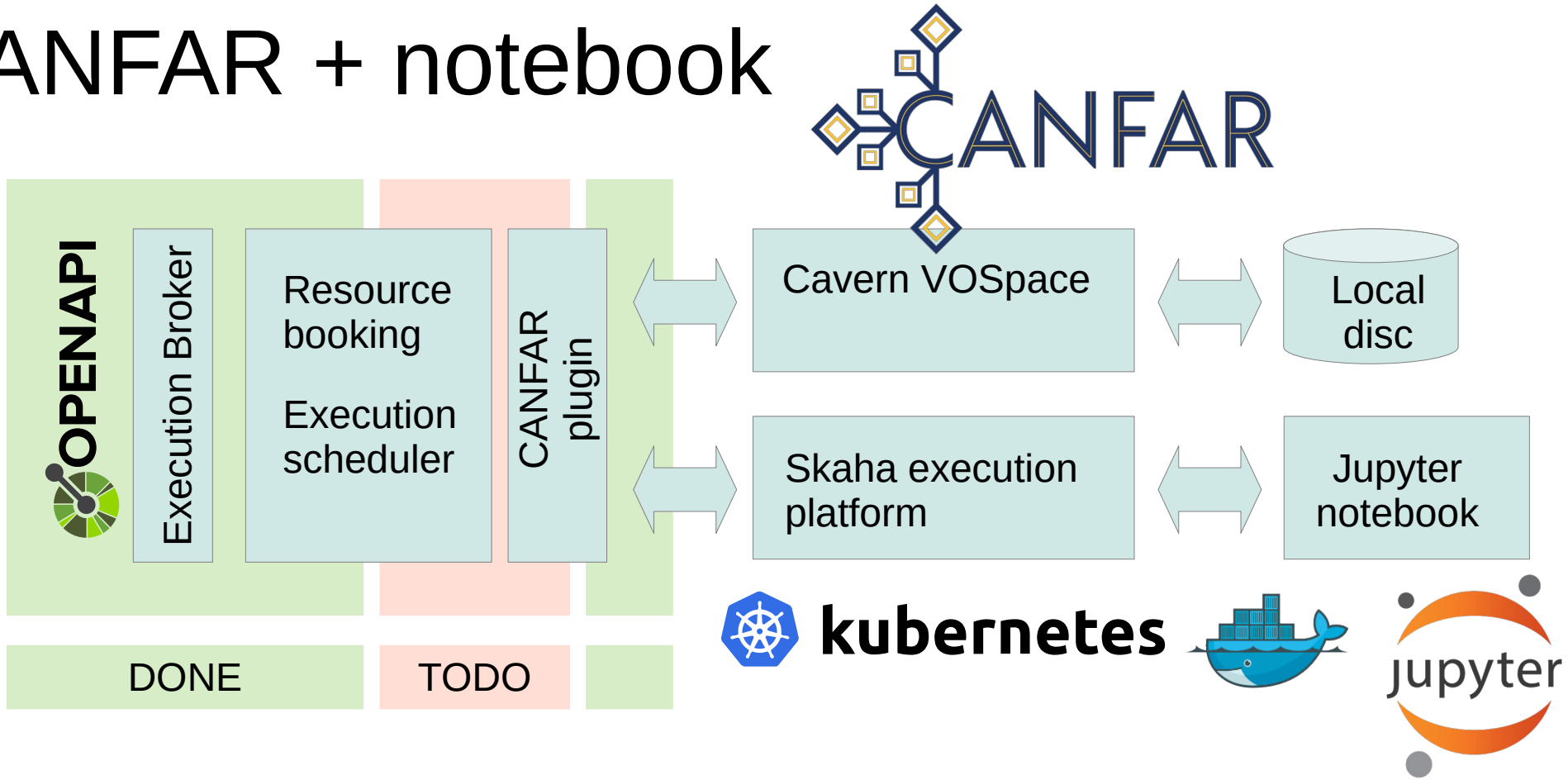
Prototype #1 PI23/24
CANFAR + notebook



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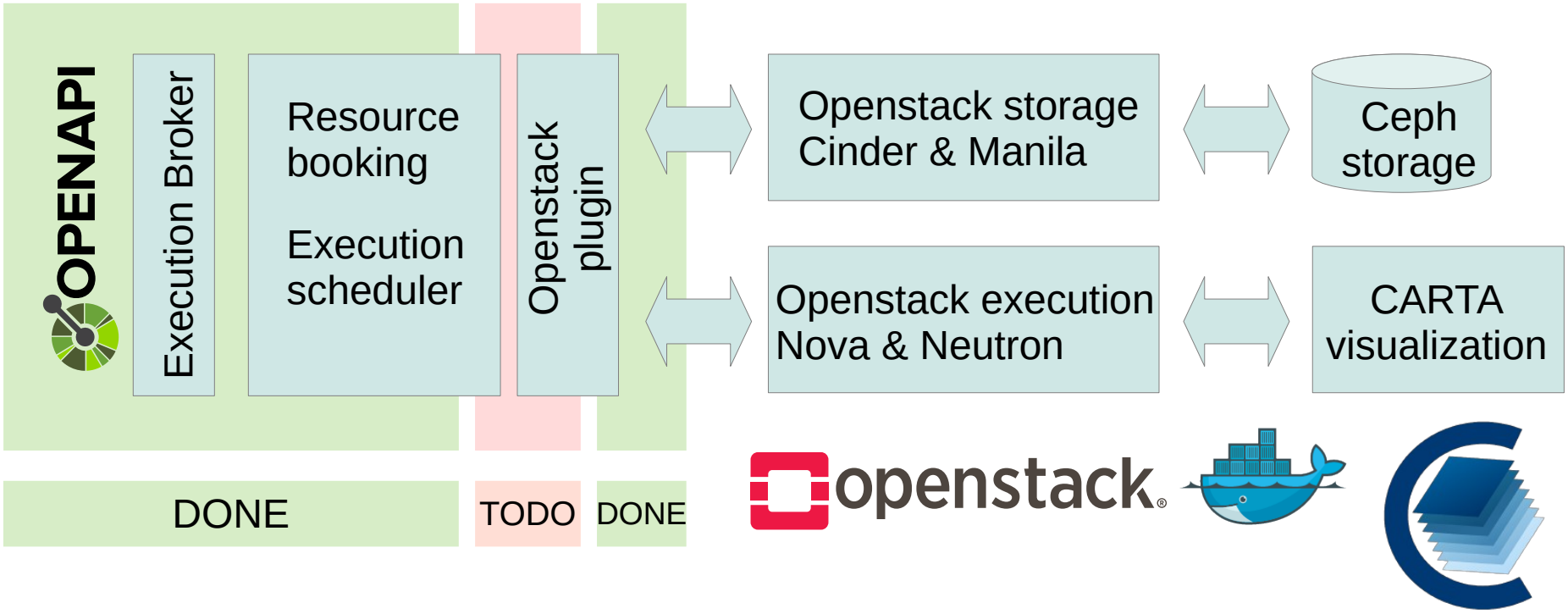
Prototype #2 PI26
Openstack + visualization



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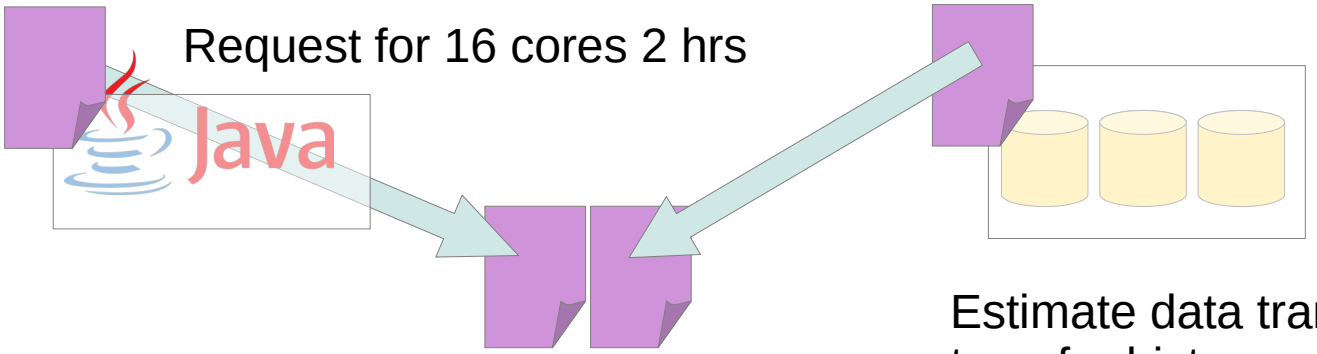
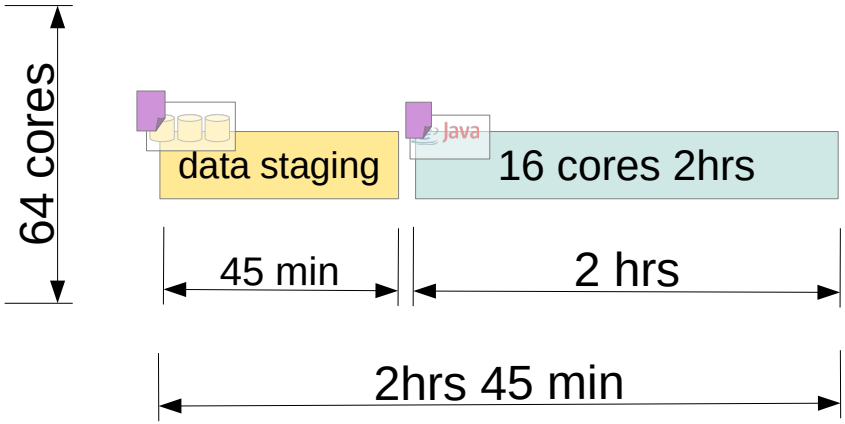
Data staging (future work)

When can I run <this> with <this> input data ?



3TiB input data in remote storage

Estimate data transfer time based on data size, transfer history, and current network metrics.



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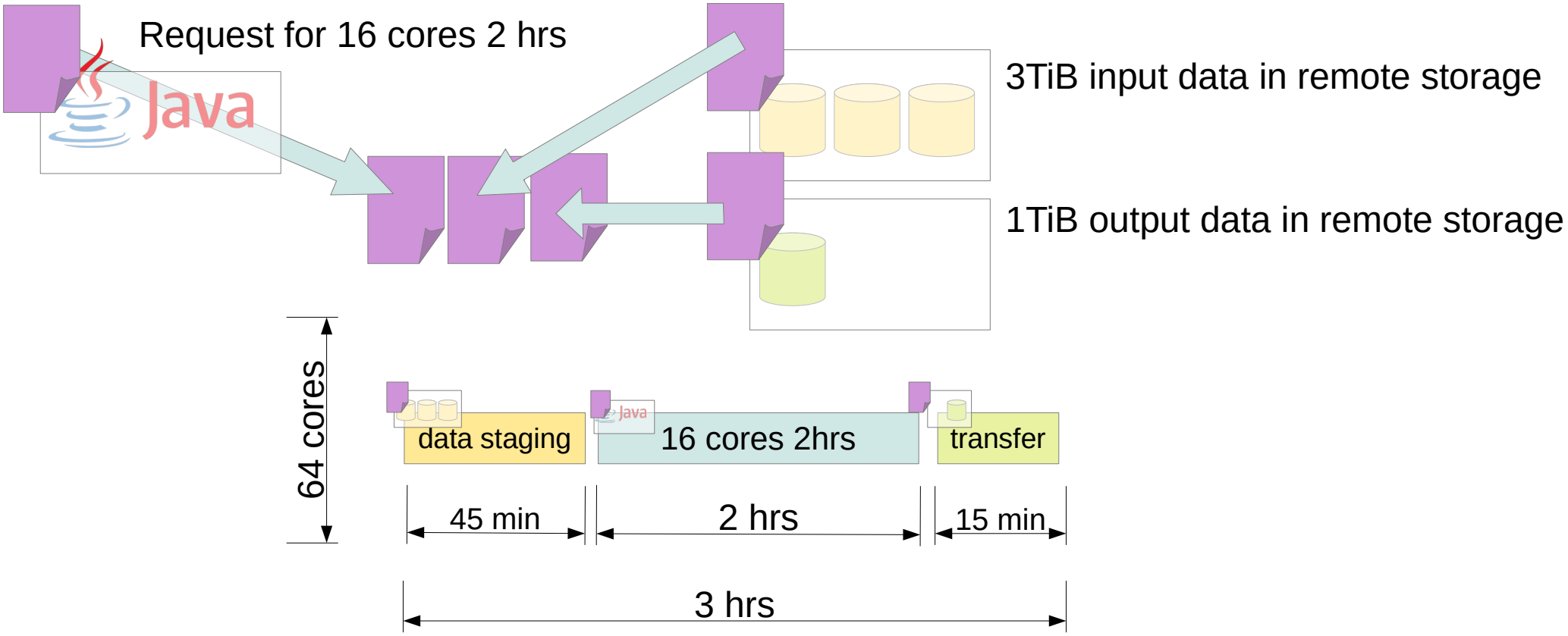
Data staging (future work)

When can I run <this> with <this> data, and put the results <there> ?



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Prototype #3 ….
Use cases

<science use case here>

GPU

Rucio data

Workflow

FPGA

SrcNet data

S3 data

processing pipeline

Slurm

Kubernetes

HTCondor

Openstack

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Thank you

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GitHub

https://github.com/ivoa-std/ExecutionBroker

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