



# IVOA - science platforms

Moving code to the data

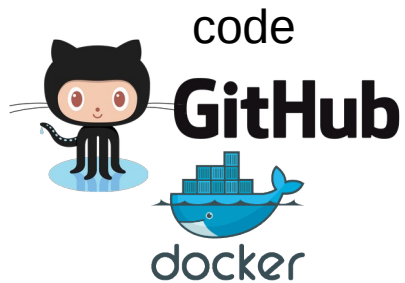
Dave Morris

ADASS XXXIII  
Science platforms BoF  
November 2023

# The problem

Heterogeneous code, data and compute.

Everyone is slightly different.



data



compute



compute



code



compute

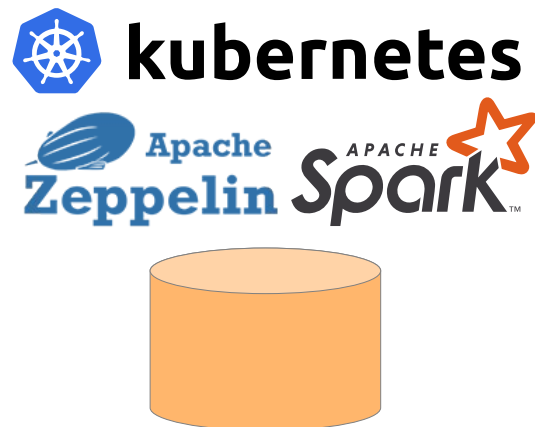
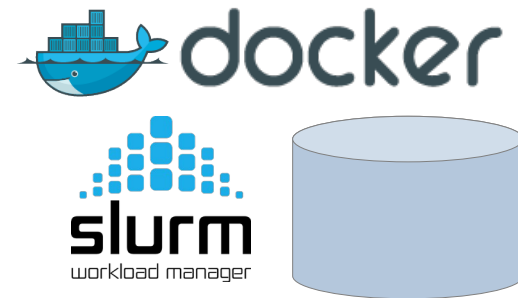


data



Current state

**Isolated platforms, local datasets**





## Moving code to another platform

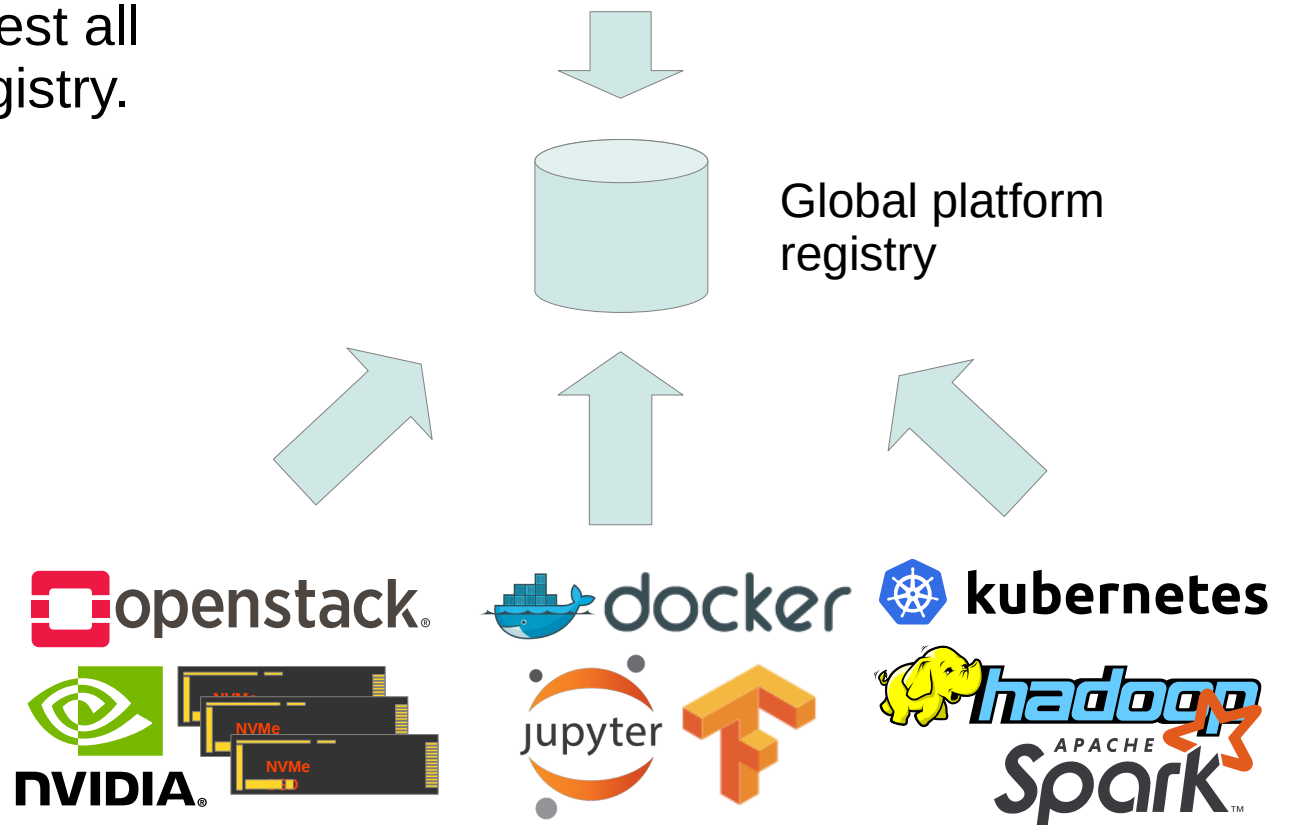
Asking the right question

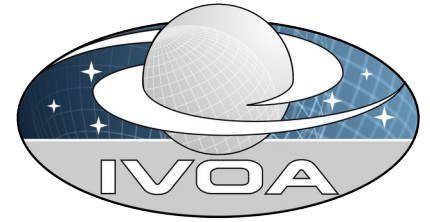
In theory, it is possible to harvest all the metadata into a central registry.

That registry would need to understand the details of all the technologies.

Which places a lot of complexity in a single entity.

Find all the platforms that can run **<this>** task





# IVOA ExecutionPlanner

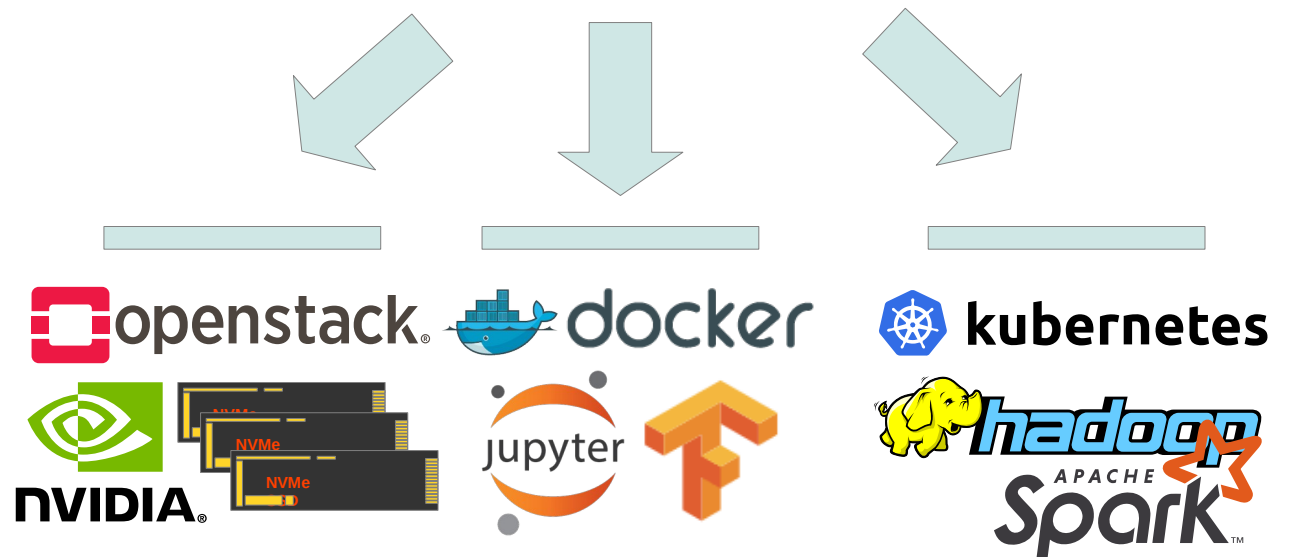
Asking the right question

Alternatively we can delegate the question to the individual platforms

Each platform only needs to understand the technologies it provides.

If a platform doesn't understand the question, it can just say no.

Can your platform run **<this>** task ?

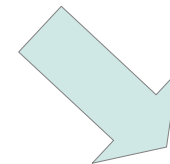
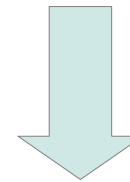
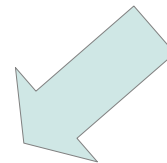


# IVOA ExecutionPlanner

Asking the right question



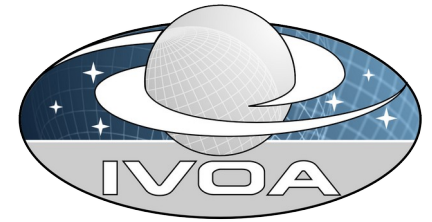
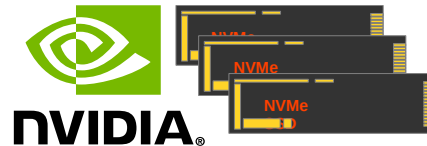
Can **<I>** run **<this>** task on your platform ?



If we add the user's identity, then the platforms can apply access controls.

The platforms can apply different quotas to different users.

If a platform doesn't understand the question, it can just say no.



# IVOA ExecutionPlanner



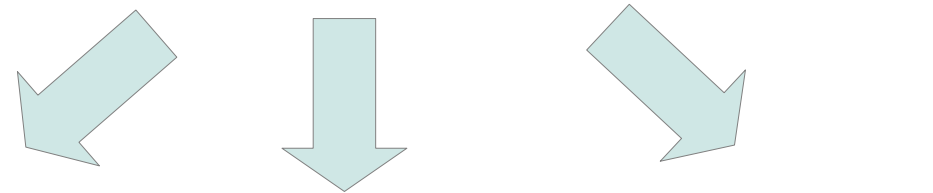
Asking the right question



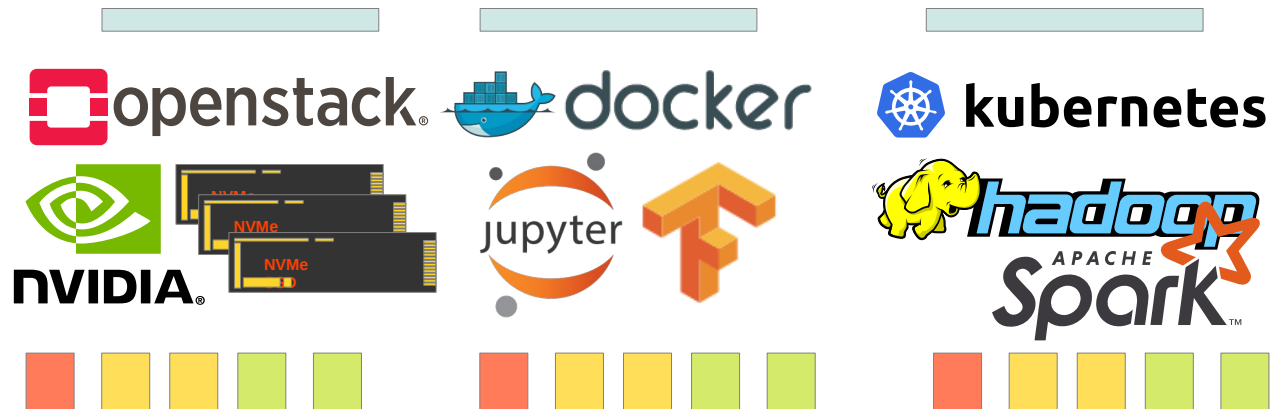
If we add time, then a platform can take account of how busy it is.

<when> can <I> run <this> task on your platform ?

The platforms can offer a range of time slots for the user to choose.

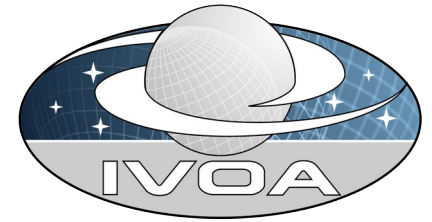
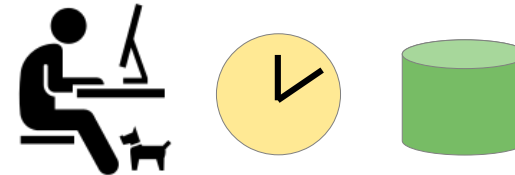


If a platform doesn't have any time available, it can just say no.



# IVOA ExecutionPlanner

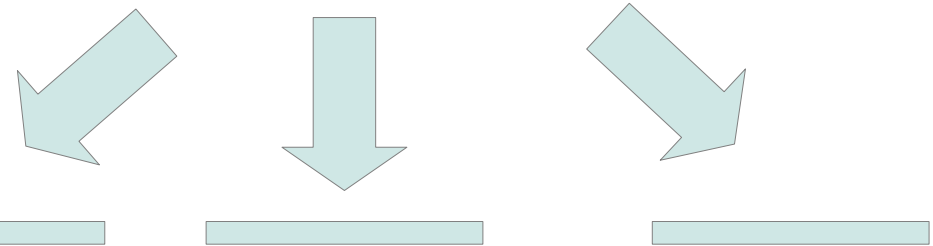
Asking the right question



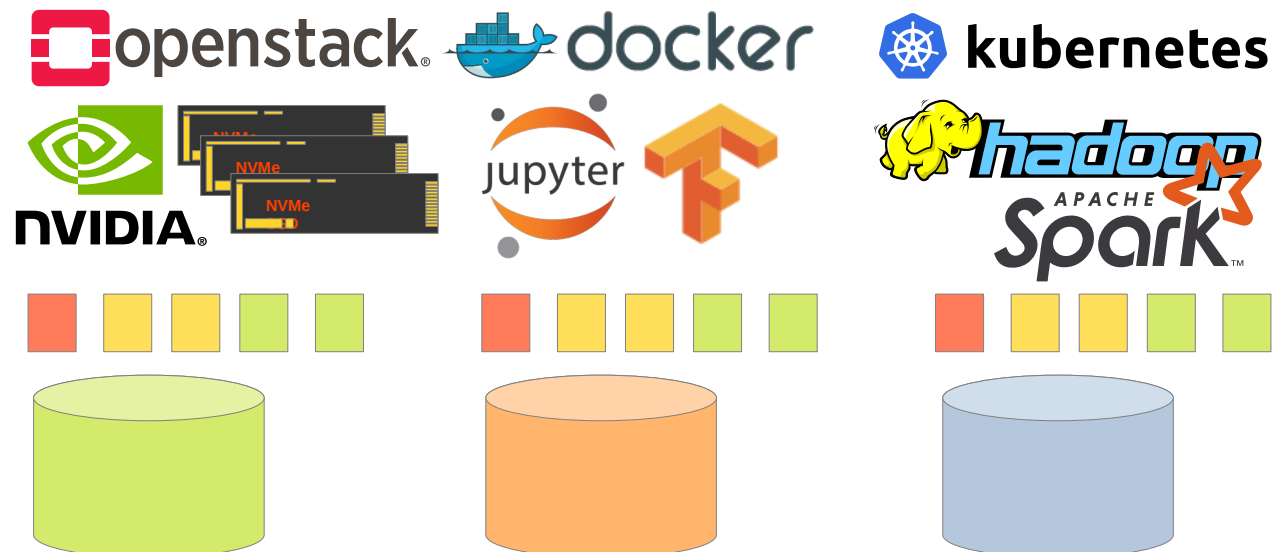
If we add data, then a platform can take account how 'close' the data is.

<when> can <I> run <this> task with <this> data on your platform ?

The platforms can quote different start-up times depending on how long it will take to stage the data.



If a platform can't access the data, it can just say no.







## Global platform registry

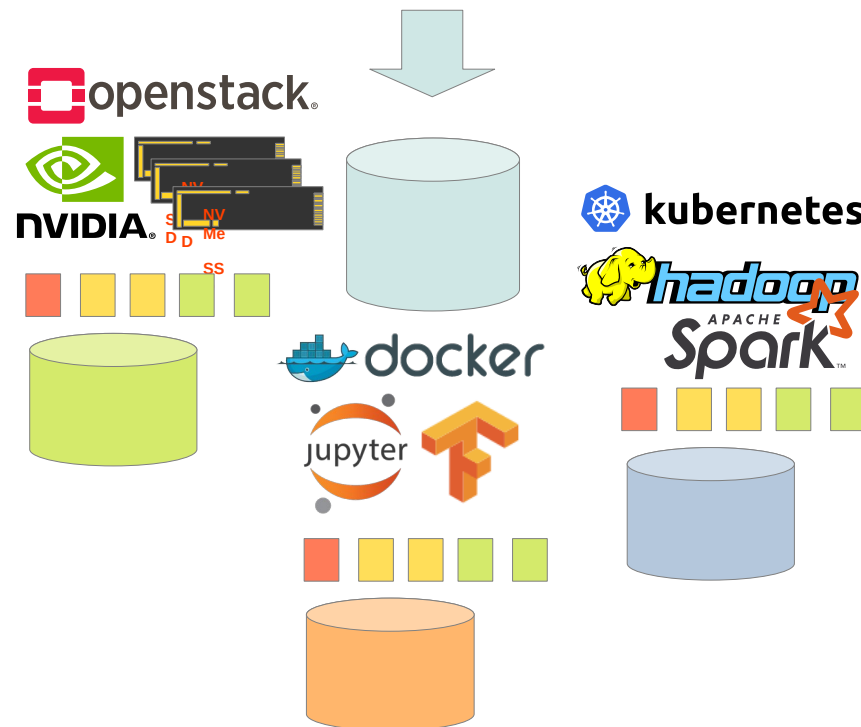
Needs to know everything about all the platforms.

Including details of all the technologies.

Including authentication and authorization.

Including loading and availability.

Find all the platforms that  
**<user>** can run **<this>**  
task with **<this>** data at  
**<this>** time.

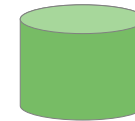
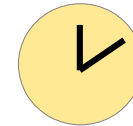
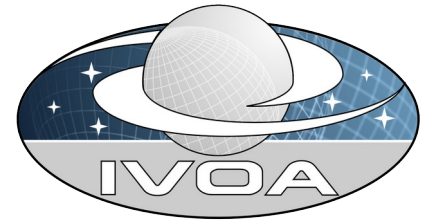


# IVOA ExecutionPlanner

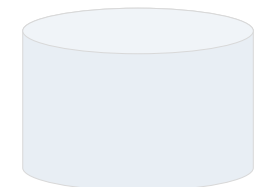
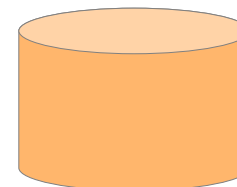
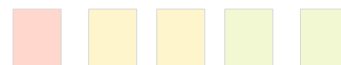
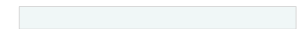
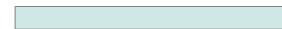
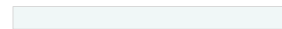
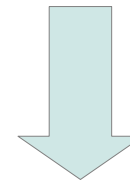
Asking the right question

Each platform only needs to know about its own capabilities.

If a platform doesn't understand the question, it can just say no.



<when> can <I> run <this> task  
with <this> data on your platform ?



# IVOA ExecutionPlanner



Initial working draft

Work in progress

We need your input

Your use cases



*International  
Virtual  
Observatory  
Alliance*

**IVOA Execution Planner**

**Version 1.0**

**IVOA Working Draft 2023-07-01**

Working Group  
GWS

This version

<https://www.ivoa.net/documents/ExecutionPlanner/20230701>

Latest version

<https://www.ivoa.net/documents/ExecutionPlanner>

**<https://github.com/ivoa-std/ExecutionPlanner>**

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