



# ESCAPE

European Science Cluster of Astronomy &  
Particle physics ESFRI research Infrastructures

## Execution Planner Interface (EPI) aka - CanIDoThis ?

IVOA interop, May 2021

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Where we are : Lots of different types of task



Different interfaces

X

Different behavior

X

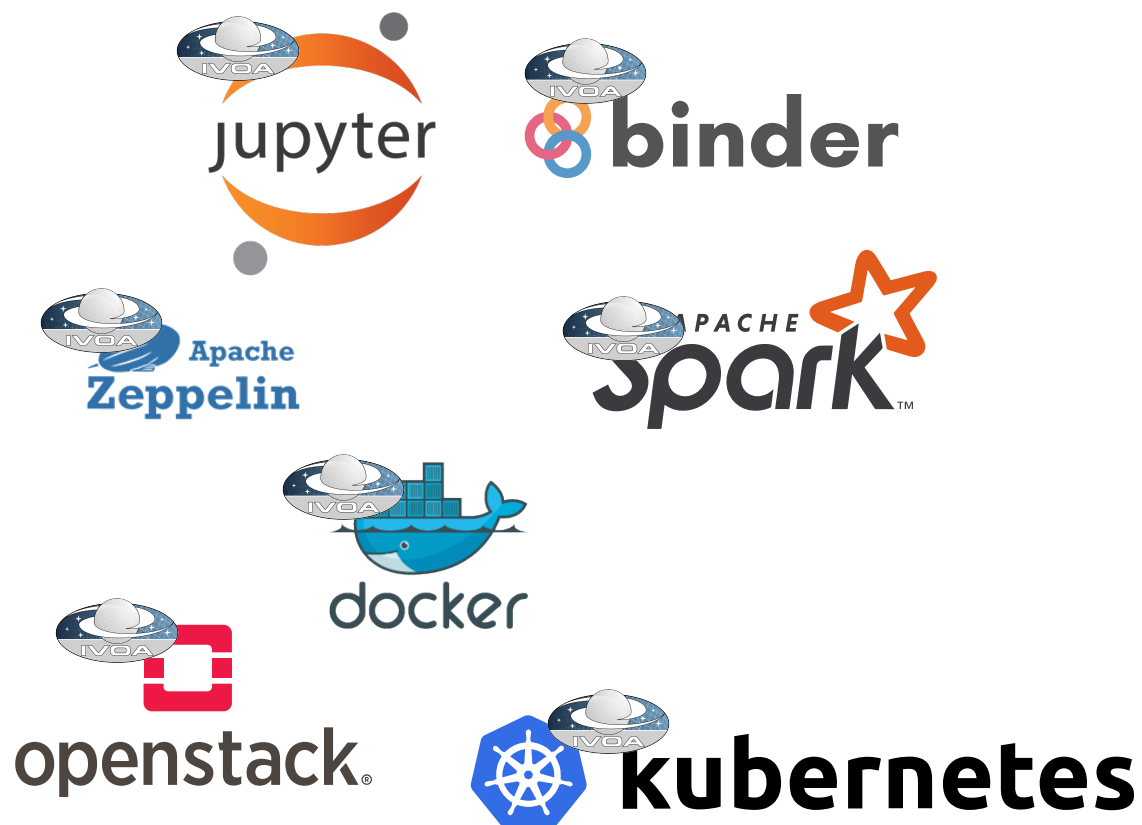
Different configuration

X

Different authentication



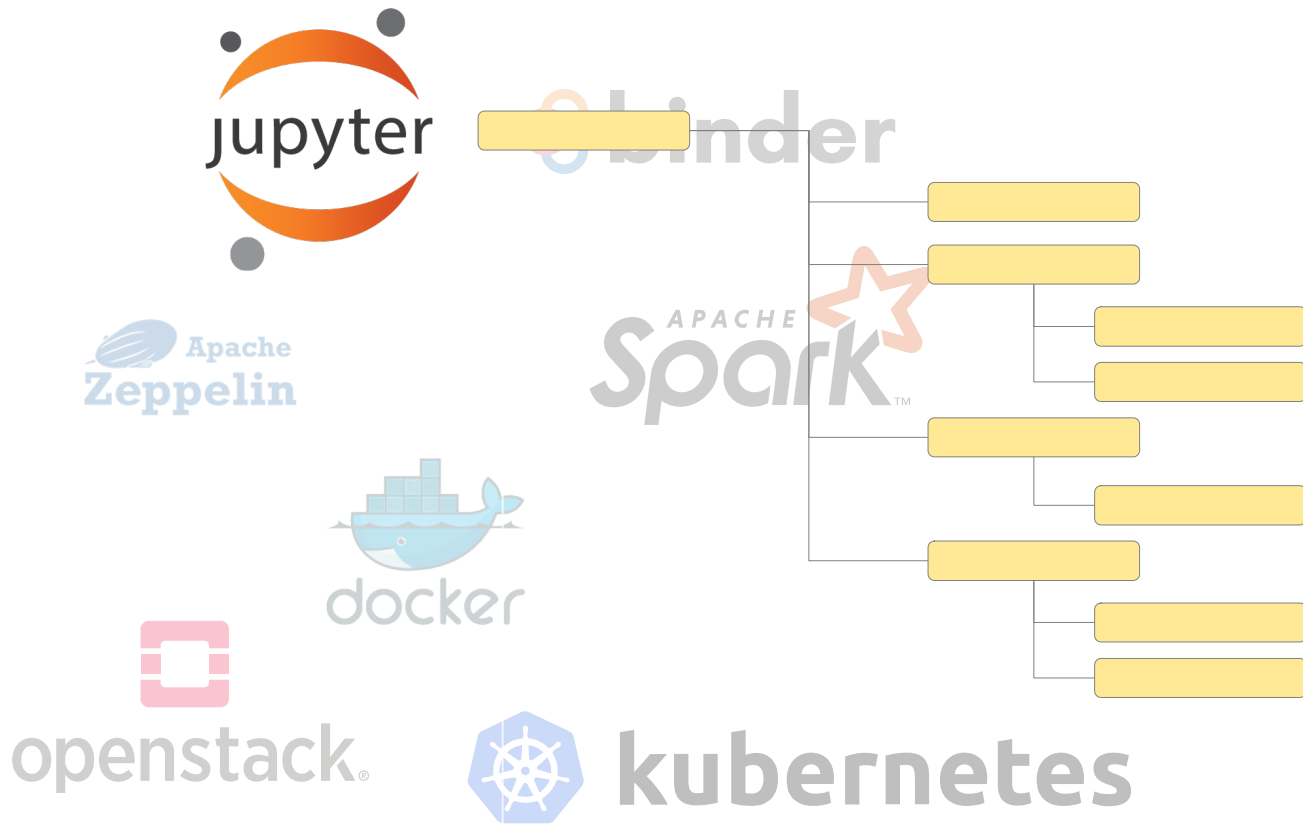
Where we want to be : inter-operable IVOA interfaces



IVOA interfaces  
+  
Consistent behavior  
+  
Common configuration  
+  
Standard authentication



Do we want to adopt everything from all the 3<sup>rd</sup> party interfaces ?



Complex interfaces

**X**

Complex behavior

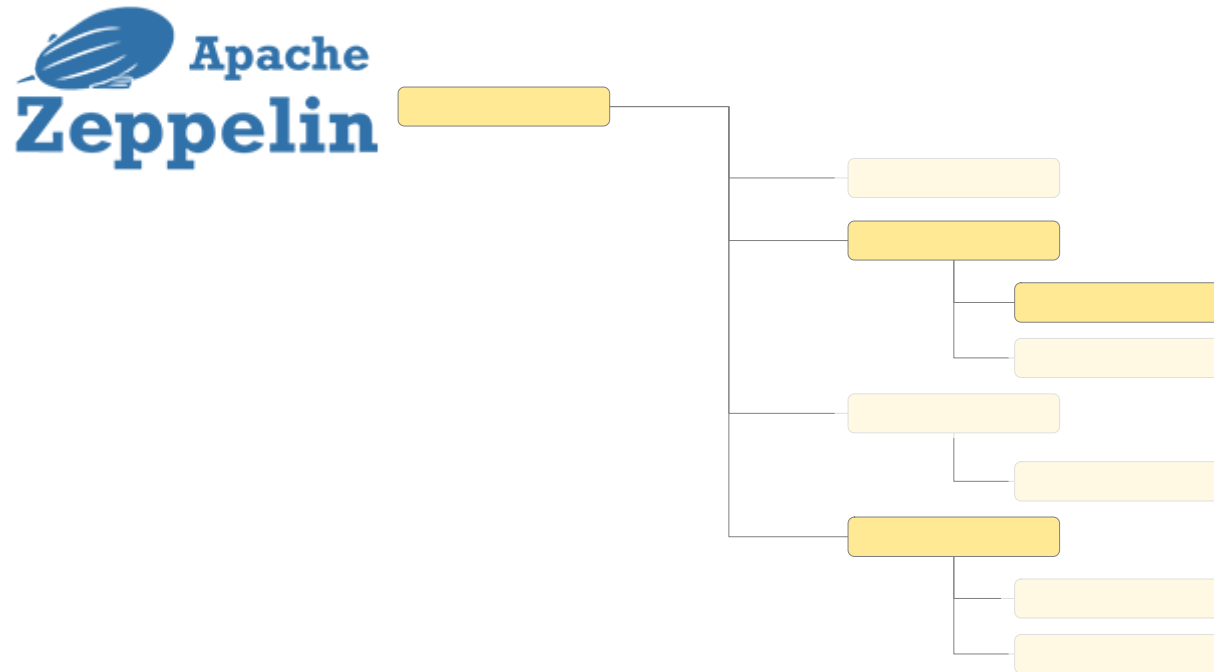
**X**

Multiple features

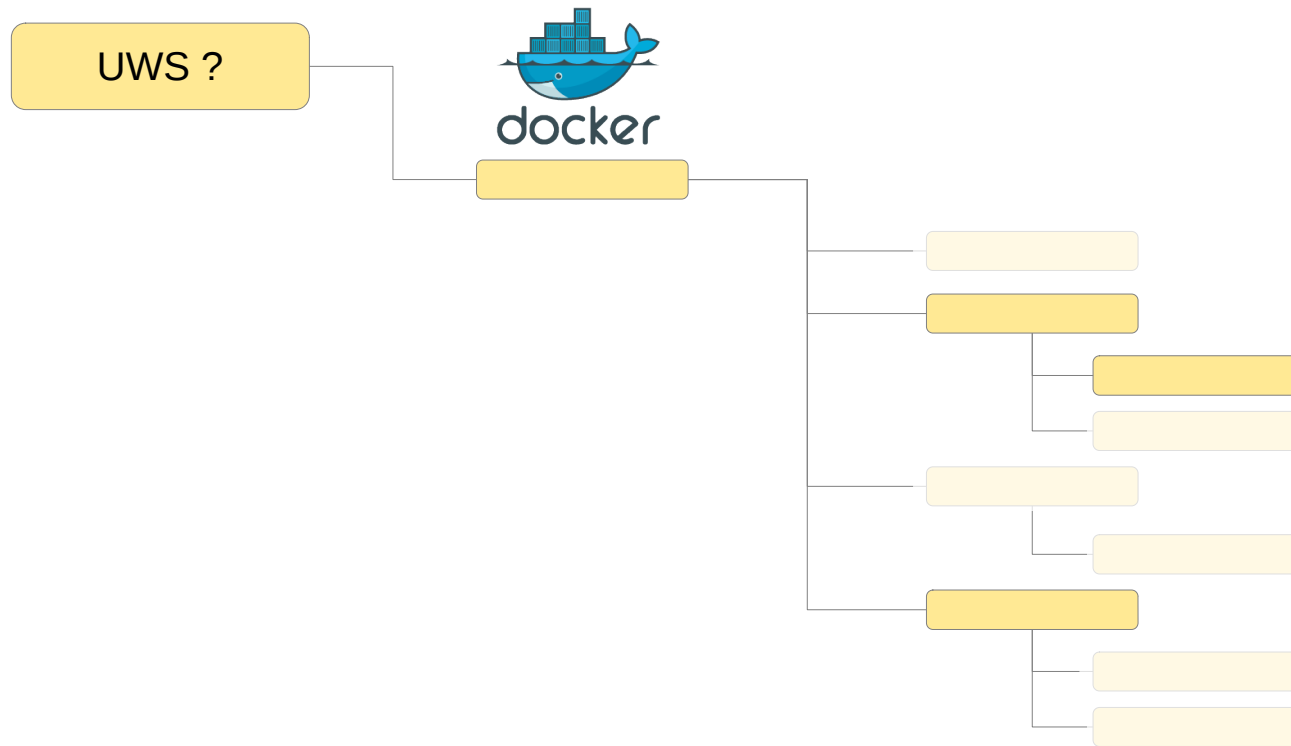
**X**

Multiple versions

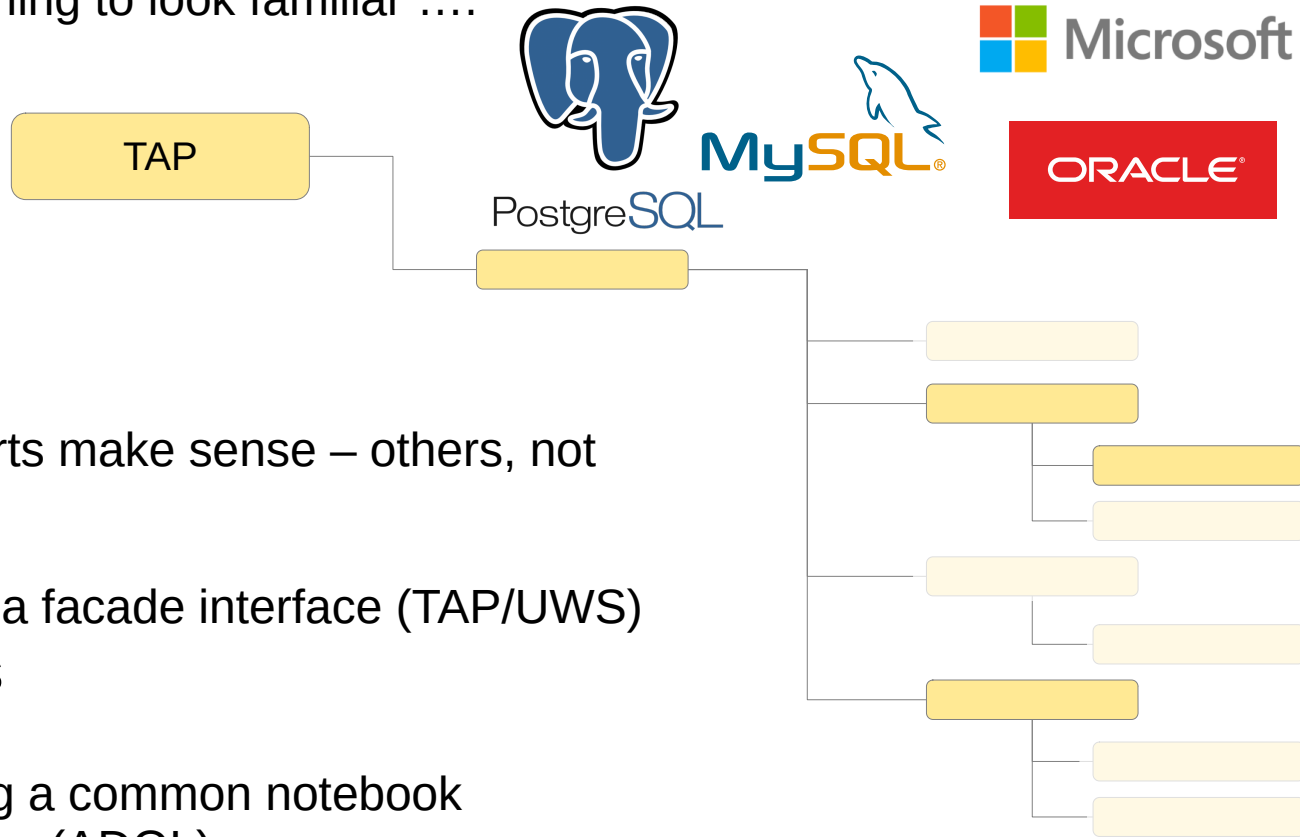
Constrain the variables - select specific parts of the functionality



## Constrain the interface – add a facade in front



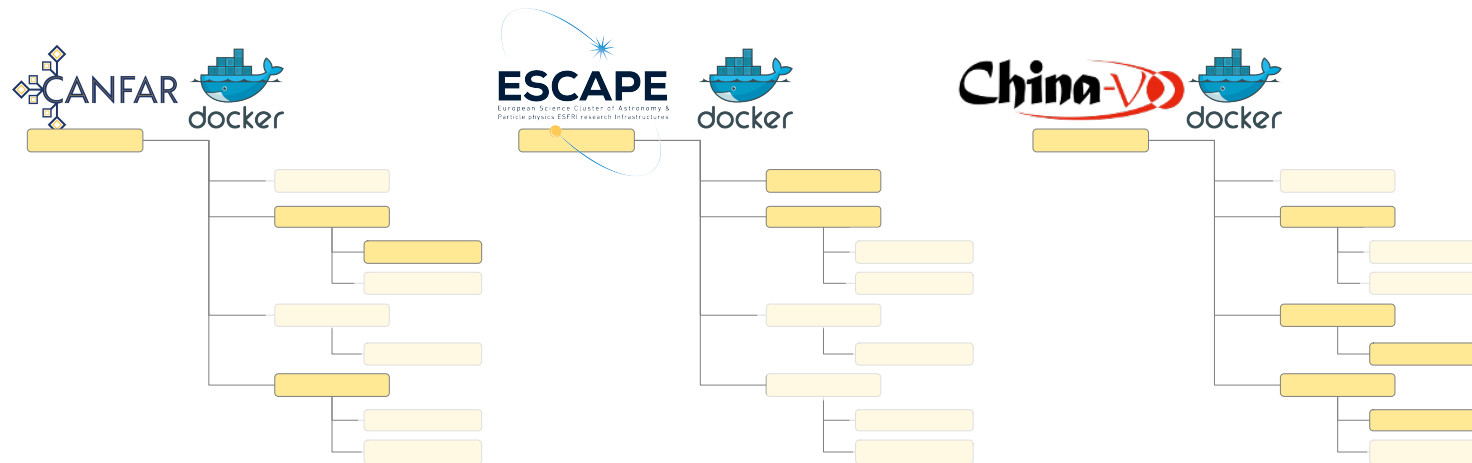
Beginning to look familiar ....



Some parts make sense – others, not

- Adding a facade interface (TAP/UWS)
  - yes
- Defining a common notebook language (ADQL)
  - no

To start with, each site will support a different subset of functionality



We can use a URL to identify each particular subset

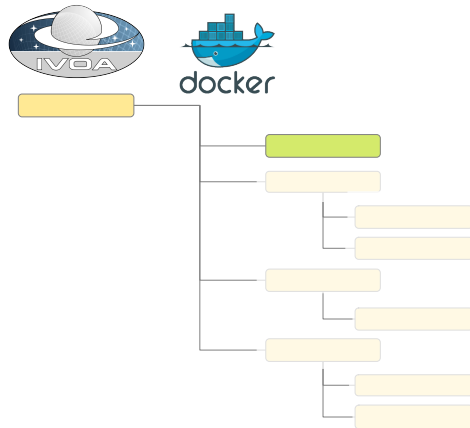
<http://cadc.ca/canfar-docker>

<http://escape.eu/docker-launcher>

<http://china-vo.org/docker-interface>



Can we define minimal sets ?



And give them URLs to identify them

<http://ivoa.net/simple-jupyter-1.0>

<http://ivoa.net/simple-docker-1.0>

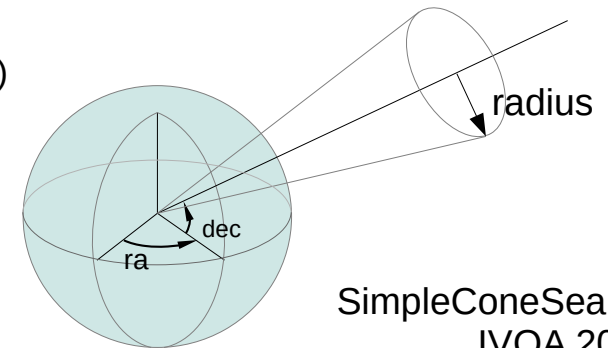
<http://ivoa.net/simple-kubernetes-1.0>

Something as simple as this ?

RA = 170° (deg)

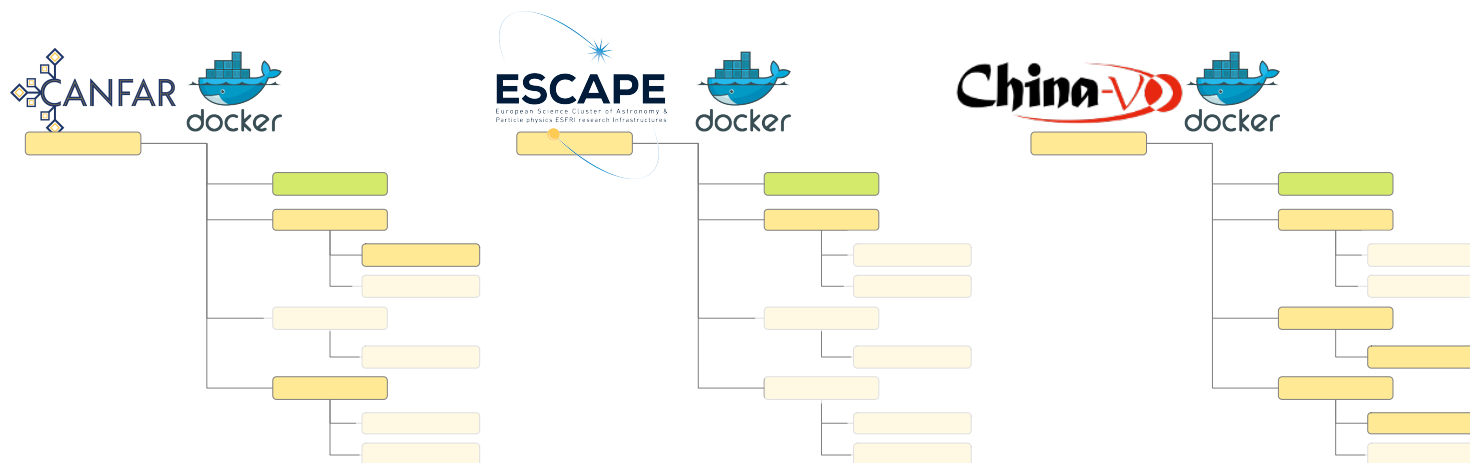
DEC = 25° (deg)

SR = 30° (deg)



SimpleConeSearch  
IVOA 2006

Sites can support the simple form along side their own



Using the URLs to declare which functionality they support

<http://ivoa.net/simple-docker-1.0>

<http://cadc.ca/canfar-docker>

<http://ivoa.net/simple-docker-1.0>

<http://escape.eu/docker-launcher>

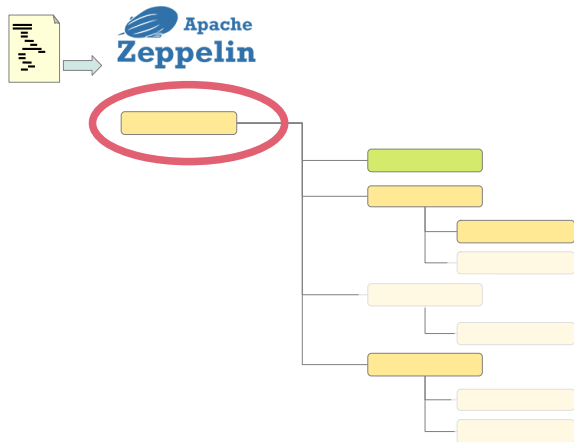
<http://ivoa.net/simple-docker-1.0>

<http://china-vo.org/docker-interface>

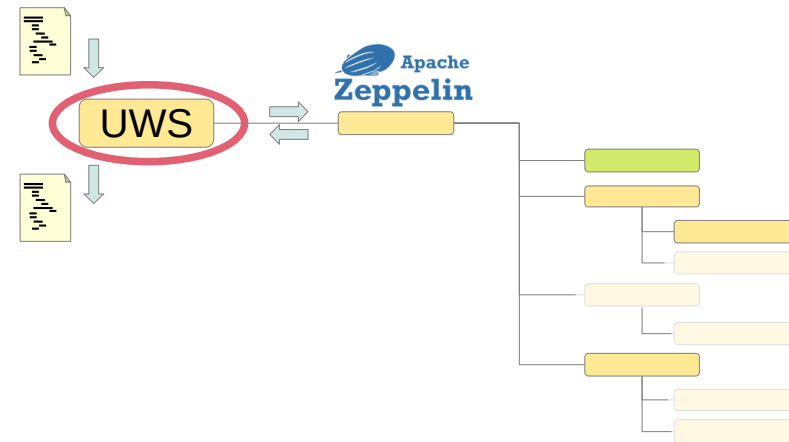
Going back to TAP, there is another aspect – synchronous or asynchronous ?

The equivalent for a science platform would be interactive or batch

For interactive - the response would contain the endpoint of a live service with the task loaded and ready to run



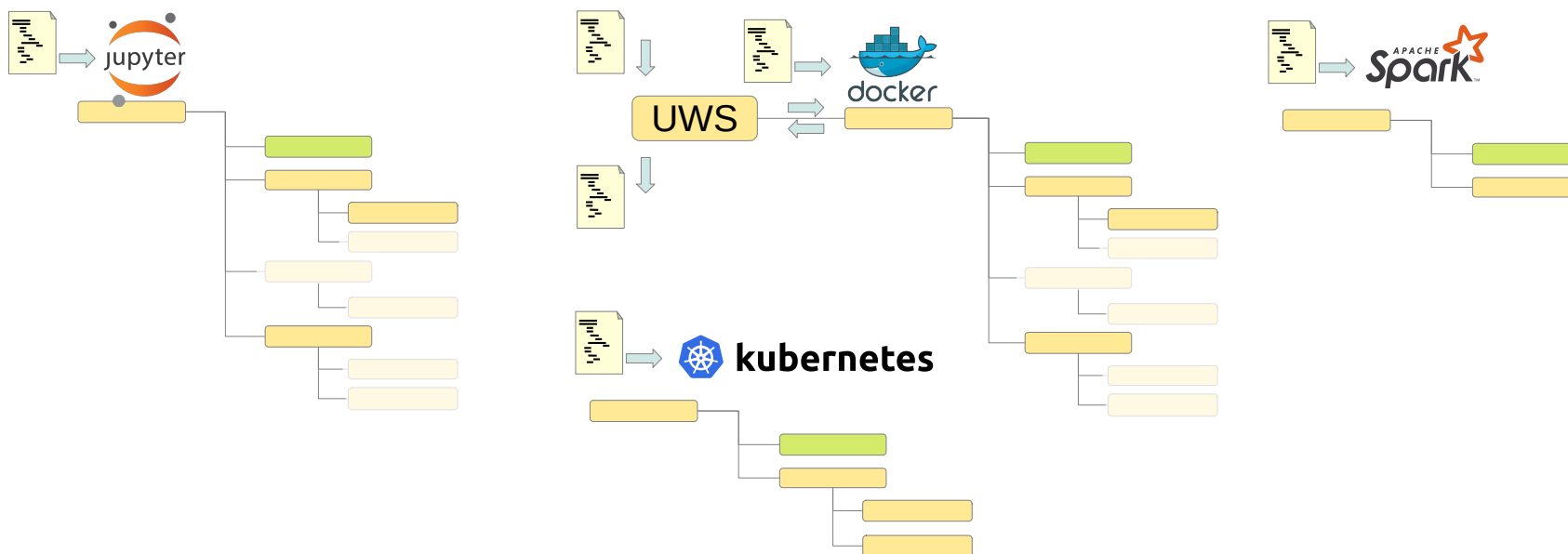
For batch – you send the task to an asynchronous service like UWS and it responds with the results when is done



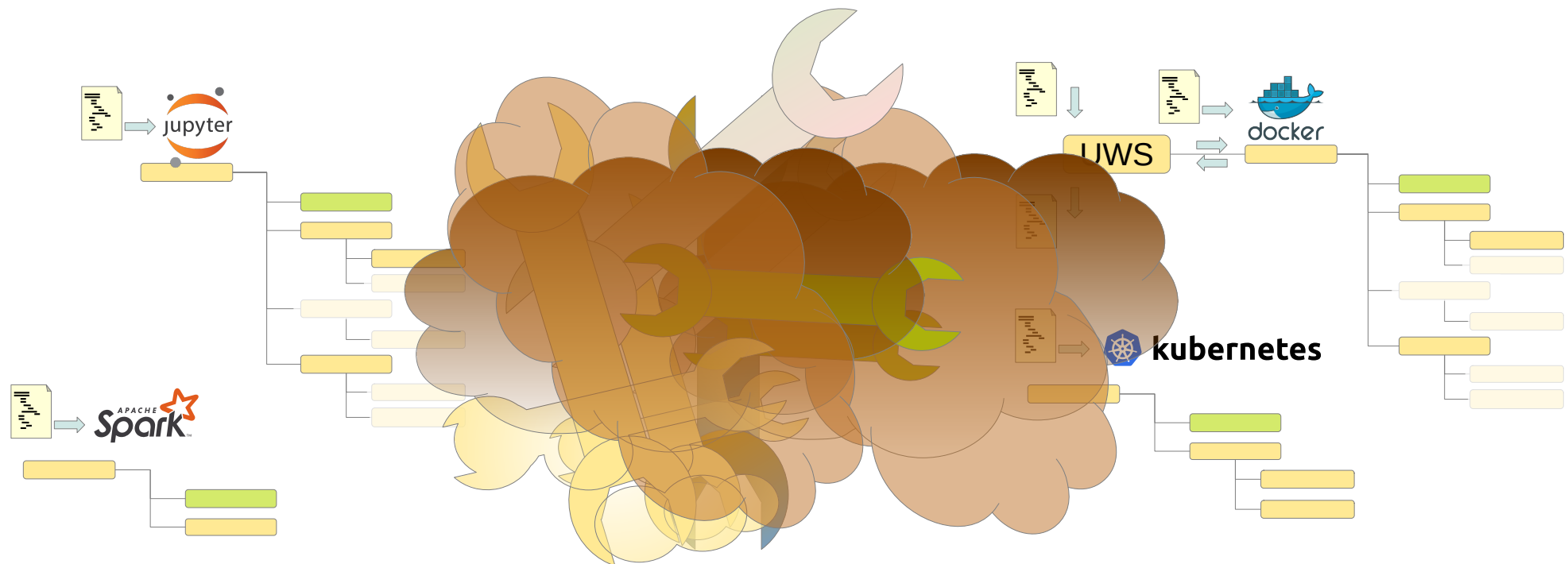
So, we have:

Lots of different types of task; Jupyter and Zeppelin notebooks, Docker containers, Kubernetes charts, Ansible roles, Python programs and Spark analyses.

Different subsets of functionality; run interactively or in batch mode ..



## Starting to look like a bag of spanners



Start with a simple question:

Can you run a Jupyter notebook ?

Can you run a CANFAR Jupyter notebook ?

Can you run a CANFAR Jupyter notebook, interactively ?



Add a simple response

Can you run an ESCAPE Docker container, interactively ?

➡ **YES** | NO

Services : <http://node21.cloud.ed.ac.uk/docker-sync>  
<http://node19.cloud.ed.ac.uk/docker-syncter>  
<http://node03.cloud.ed.ac.uk/docker-sync>

➡ YES | **NO**

Reason : <optional description of why not>

Simple, generic request | response

Can you run <task-type> <mode> ?

➔ **YES** | NO

Services[] - <url>  
- <url>  
- <url>

➔ YES | **NO**

Reason : <text>

Simple enough to be in the  
service registration

Capabilities[] - <task-type>, <mode>  
- <task-type>, <mode>  
- <task-type>, <mode>

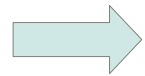


## Identity and task specific request

Can [I] run [this] <task-type> <mode> ?

Identity provided by IVOA SSO

Task details provided as <URL>

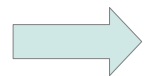


**YES** | NO

Services[] - <url>  
- <url>  
- <url>

Points to task specific details

Specific datasets and formats  
e.g. Gaia DR3 in parquet



YES | **NO**

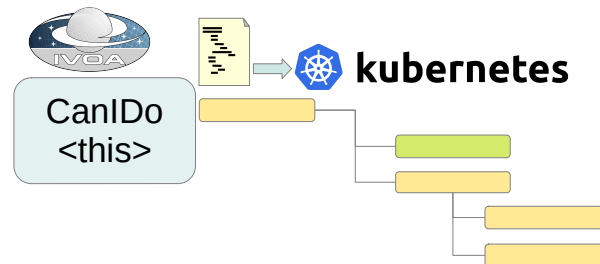
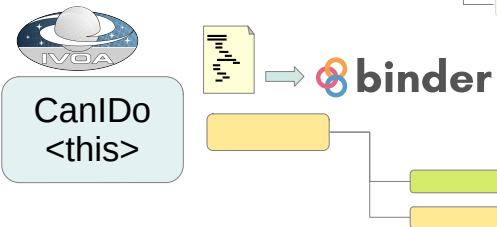
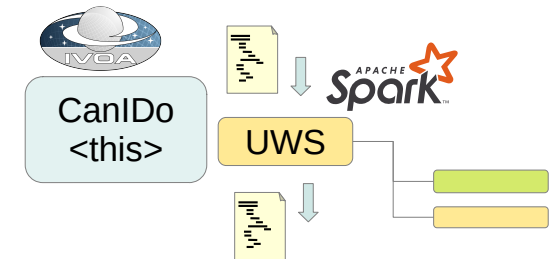
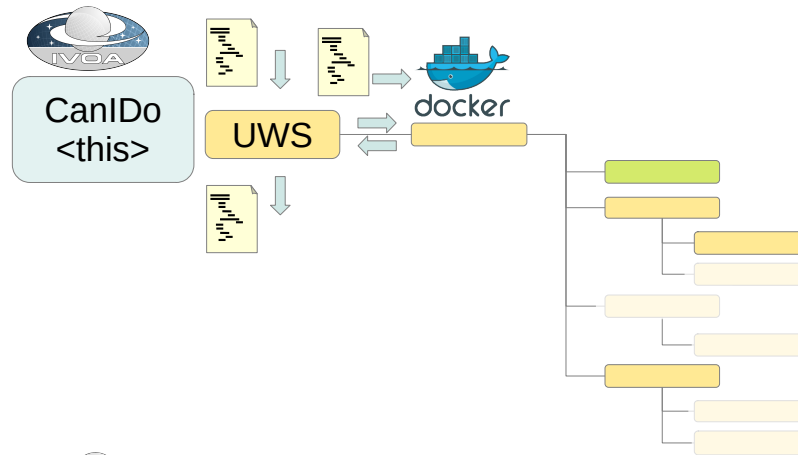
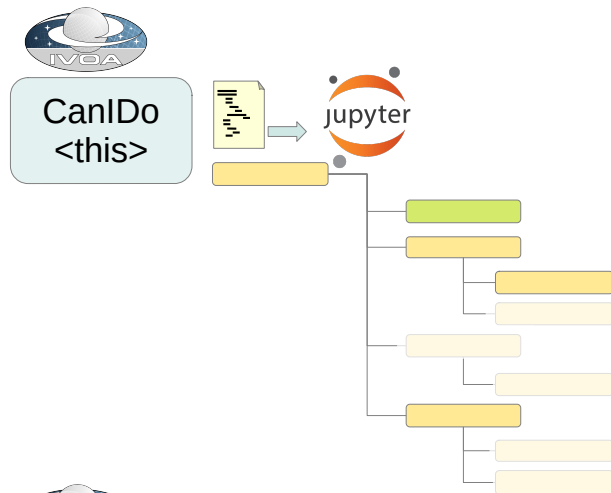
Reason : <text>

Specific libraries

e.g. numpy==1.19.5  
scipy==1.6.3



Different sites supporting different types of tasks  
 Some sites support common subset of functionality  
 Simple entrypoint interface at each location





CanIDo <this>

Can [I] run [this] <task-type> <mode> ?



**YES** | NO

Services[] - <url>  
- <url>  
- <url>



YES | **NO**

Reason : <text>

Simple **STATELESS** web service

- Identity provided by IVOA SSO
- Task type identified as <URL>
- Task details linked as <URL>

Technically possible to do some of this using UWS quote

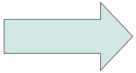
Requires a stateful web service, with storage for job state etc.





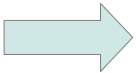
CanIDo <this>

Can [I] run [this] <task-type> <mode> ?



**YES** | NO

Services[] - <url>  
- <url>  
- <url>



YES | **NO**

Reason : <text>

If we provide a proof of concept implementation, would you run it at your site ?

Is this enough to get us off the ground ?

