IVOA Execution Planner (EP)
aka - CanIDoThis ?

IVOA interop, Nov 2021

D.Morris, University of Edinburgh

Where we are : Lots of different types of task

Different interfaces
X
Different communities
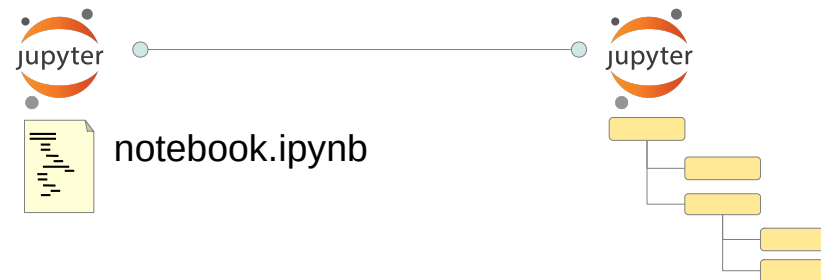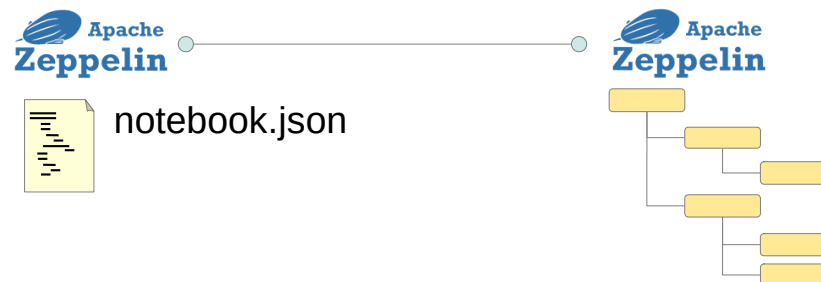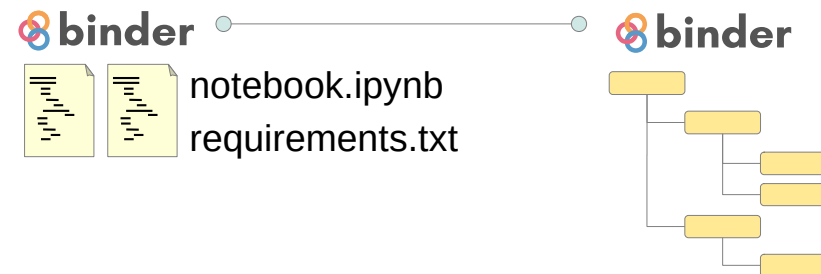**X**
Different configuration
X
Different authentication

Notebook platforms

General case, a single notebook to define a task

The notebook content is task dependent

notebook.ipynb

notebook.ipynb
requirements.txt

notebook.json

Container platforms

General case, a single config file to define a task

The config file content is task dependent

docker.img

compose.yml

helm.chart
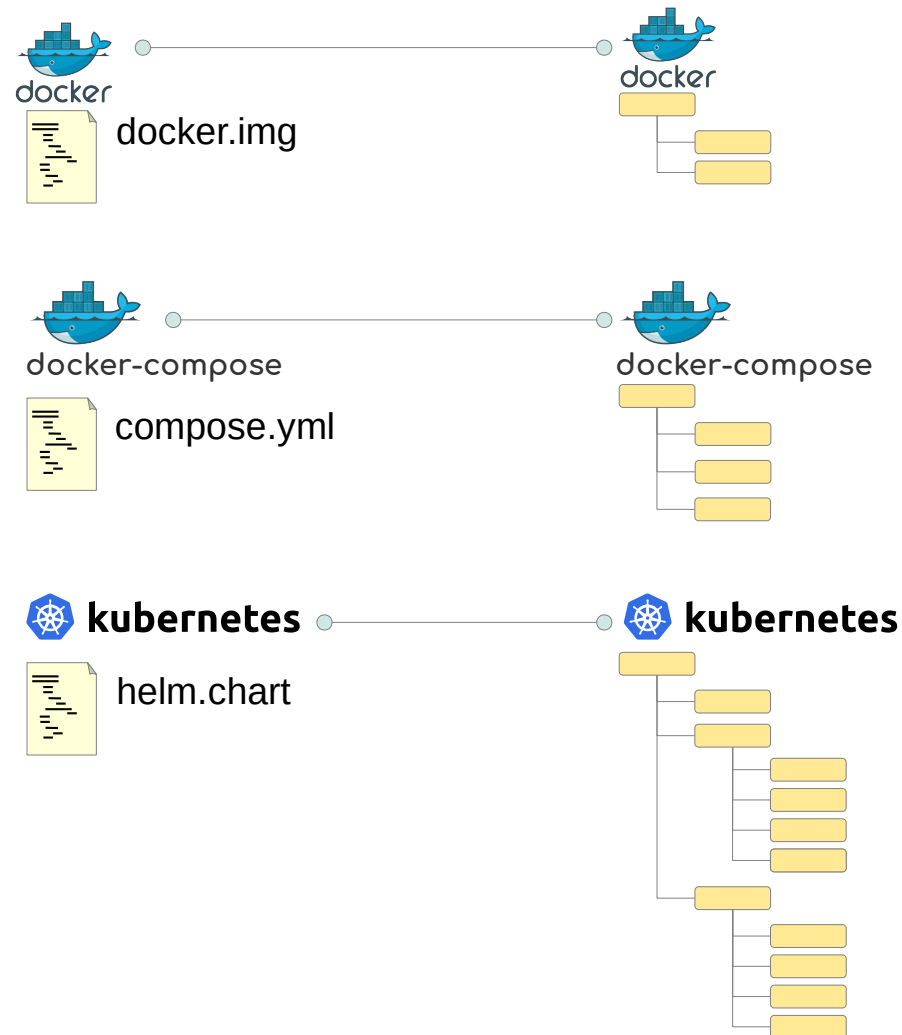
Reality isn't lined up as nicely

Reality is messy

docker-compose

compose.yml

jupyter

jupyter

binder

notebook.ipynb

docker

docker.img

binder

notebook.ipynb
requirements.txt

Apache Zeppelin

kubernetes

kubernetes

Apache Zeppelin

notebook.json

helm.chart

docker

docker-compose

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Particle physics ESFRI research infrastructures

docker-compose

compose.yml

jupyter

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notebook.ipynb

Centralised
solution is
complex

binder

notebook.ipynb
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Apache
Zeppelin

notebook.json

kubernetes

helm.chart

docker

Simple HTTP request

Identity provided by IVOA SSO

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

Task details provided in POST data
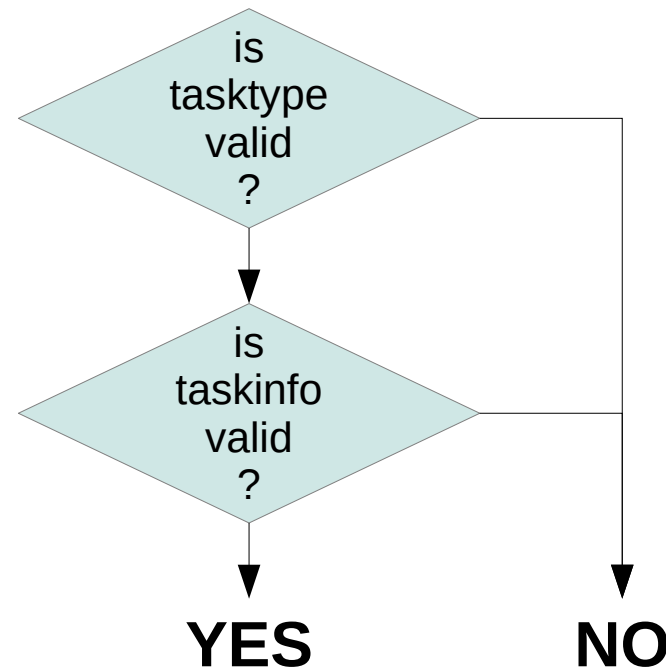
Simple HTTP request

```
{
"tasktype": "uri://docker-container",
"taskinfo": {
   "image": "docker.io/example:1.0"
   }
}
```

is tasktype valid ?

is taskinfo valid ?

YES   **NO**

Simple HTTP request

Identity provided by IVOA SSO

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

Task details provided in POST data

Simple JSON response

YES | NO

```
{
"reponseword": "YES",
"servicetype": "uri://docker-uws",
"serviceinfo": {
    "endpoint": "http://example.org/dkuws",
    }
}
```

YES | **NO**

```
{
"reponseword": "NO",
}
```

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Simple HTTP request

Identity provided by IVOA SSO

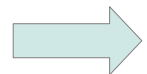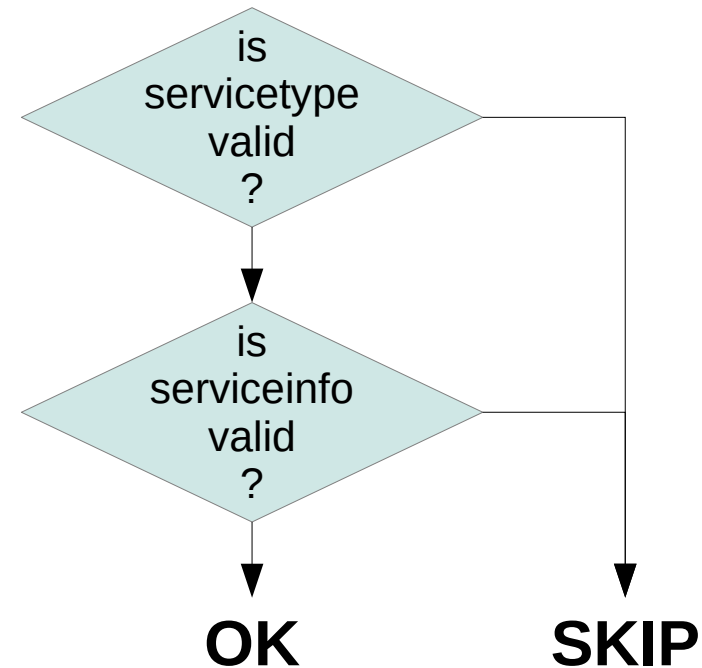Can [I] run [this] <task-type> ?
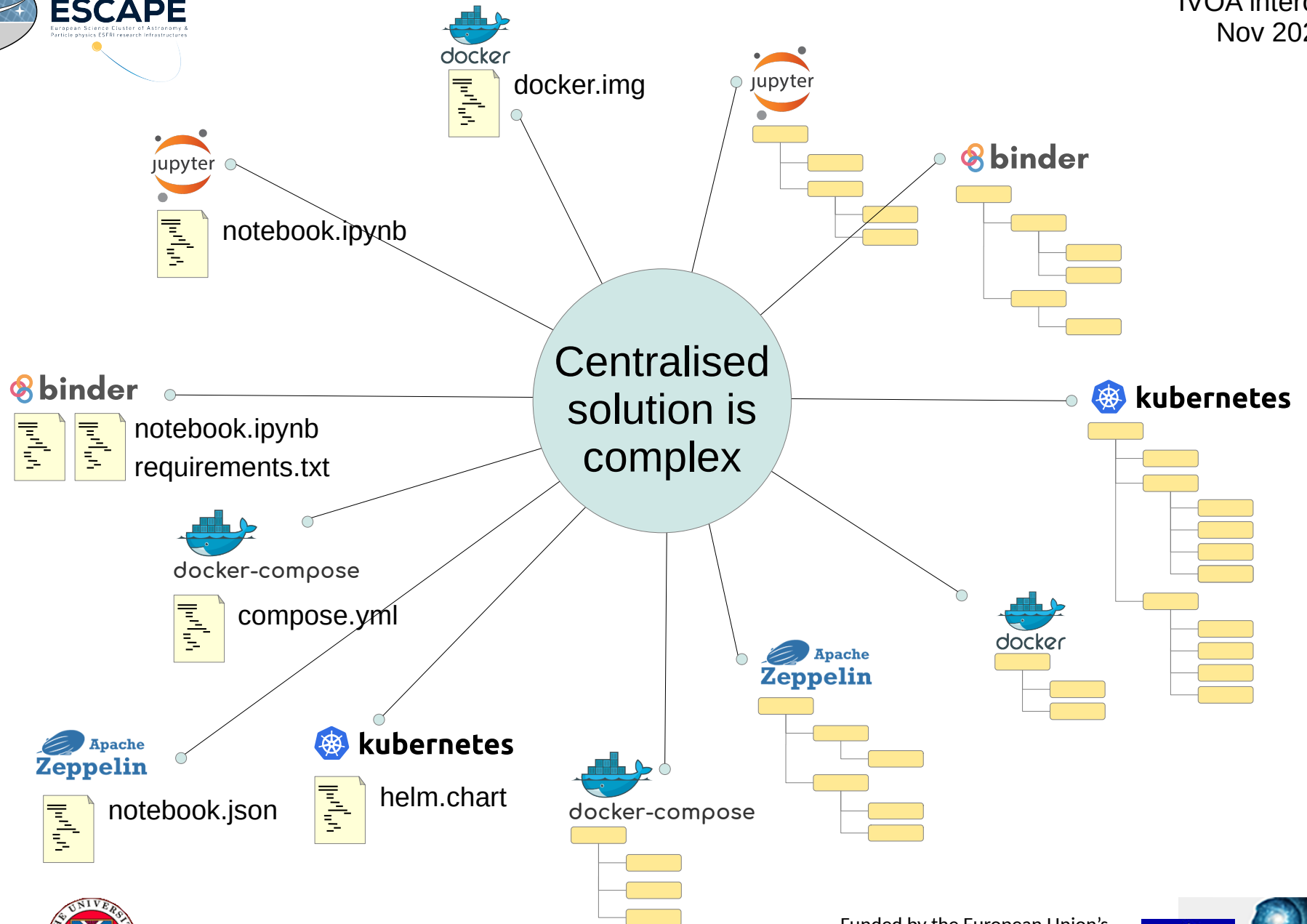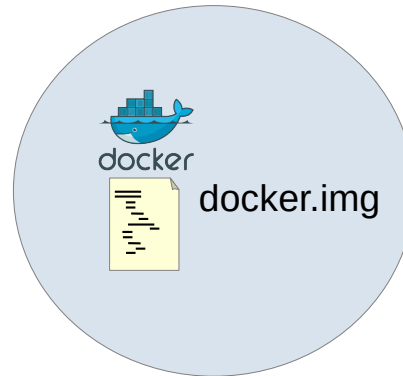
Task details provided in POST data

Simple JSON response

```
{
"reponseword": "YES",
"servicetype": "uri://docker-uws",
"serviceinfo": {
    "endpoint": "http://example.org/dkuws",
    }
}


{
"reponseword": "NO",
}
```

is
servicetype
valid
?

is
serviceinfo
valid
?

OK   SKIP

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docker.img

notebook.ipynb

binder

Centralised
solution is
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docker-compose
compose.yml

docker

Apache
Zeppelin

Apache
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notebook.json

kubernetes
helm.chart

docker-compose

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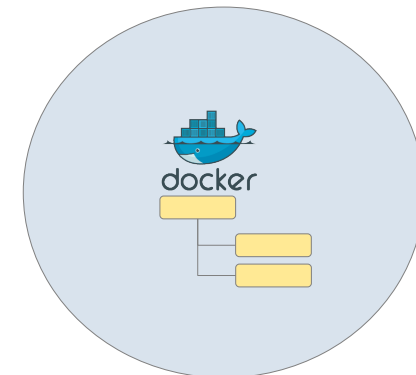
docker.img

```
{
"tasktype": "uri://docker-container",
"taskinfo": {
    "image": "docker.io/example:1.0"
    }
}
```

```
{
"reponseword": "YES",
"servicetype": "uri://docker-uws",
"serviceinfo": {
    "endpoint": "http://example.org/uws",
    }
}
```

Task-info and service-info are type specific

Solved by the docker-uws community

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Resource requirements

docker.img


```
{
"tasktype": "uri://docker-container",
"taskinfo": {
    "image": "docker.io/example:1.0"
    }


"resources": {
    mincores:  8
    maxcores:
    minmemory:  8G
    maxmemory:
    minduration: 10m
    maxduration:
    }
}
```

```
{
"reponseword": "YES",
"servicetype": "uri://docker-uws",
"serviceinfo": {
    "endpoint": "http://example.org/uws",
    }


"resources": {
    mincores:  8
    maxcores: 10
    minmemory:  8G
    maxmemory: 10G
    minduration: 10m
    maxduration: 20m
    }
}
```
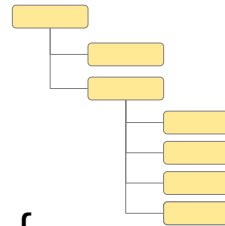
Gaia ML analysis example

kubernetes

helm.chart

```
{
"tasktype": "uri://kubernetes-helm",
"taskinfo": {
    "chart": "http:///example.org/heml.chart"
    }
"resources": {
    mincores: 220
    maxcores:
    minmemory: 360G
    maxmemory:
    minduration: 9h
    maxduration:
    }
}
```

kubernetes

```
{
"reponseword": "YES",
"servicetype": "uri://kubernetes-helm",
"serviceinfo": {
    "endpoint": "http://example.org/kws",
    }
"resources": {
    mincores: 220
    maxcores: 240
    minmemory: 360G
    maxmemory: 400G
    minduration: 9h
    maxduration: 9h30m
    }
}
```

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IVOA notes in progress

IVOA Execution Planner

Execution Planner design

+ Prototype implementation in development

Dave Morris

Sara Bertocco

UWS Container Execution Service

UWS Docker container execution service

+ Prototype implementation in development

Dave Morris

Sara Bertocco

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