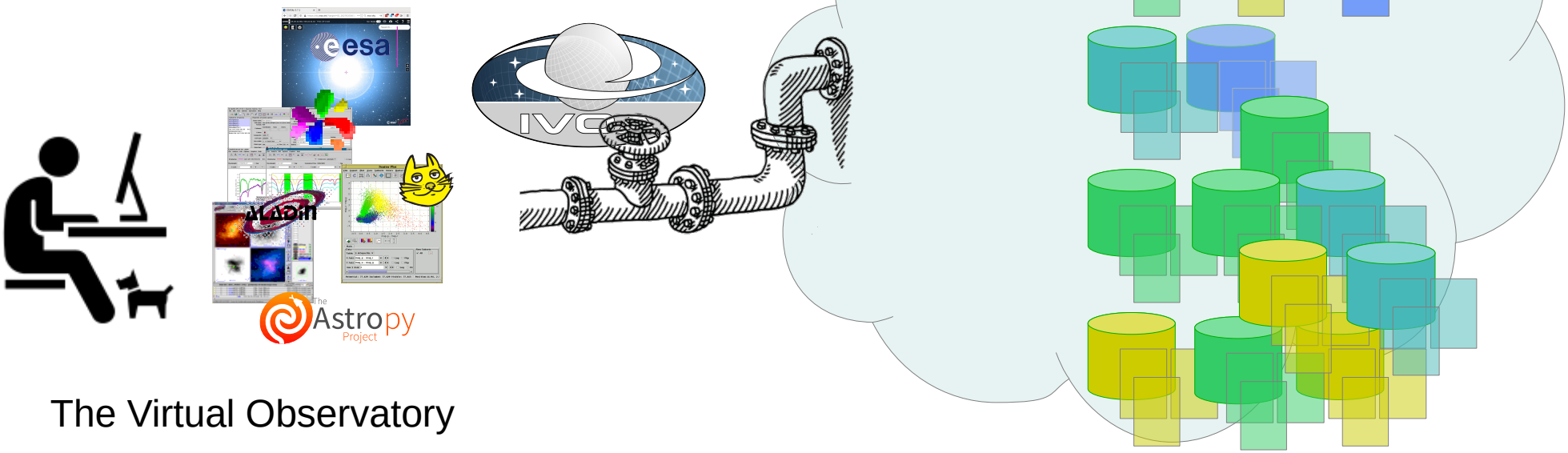

The Virtual Observatory

All the data from all the world …. in the cloud

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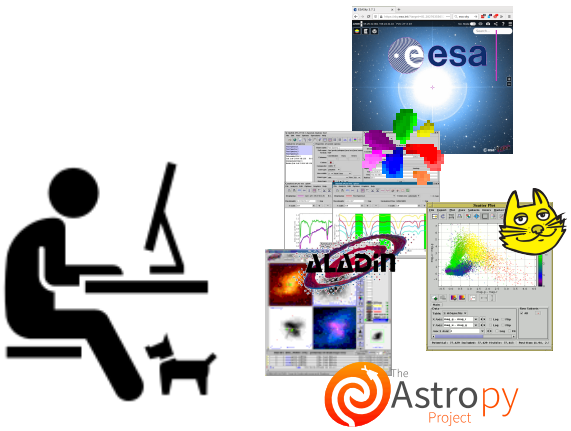

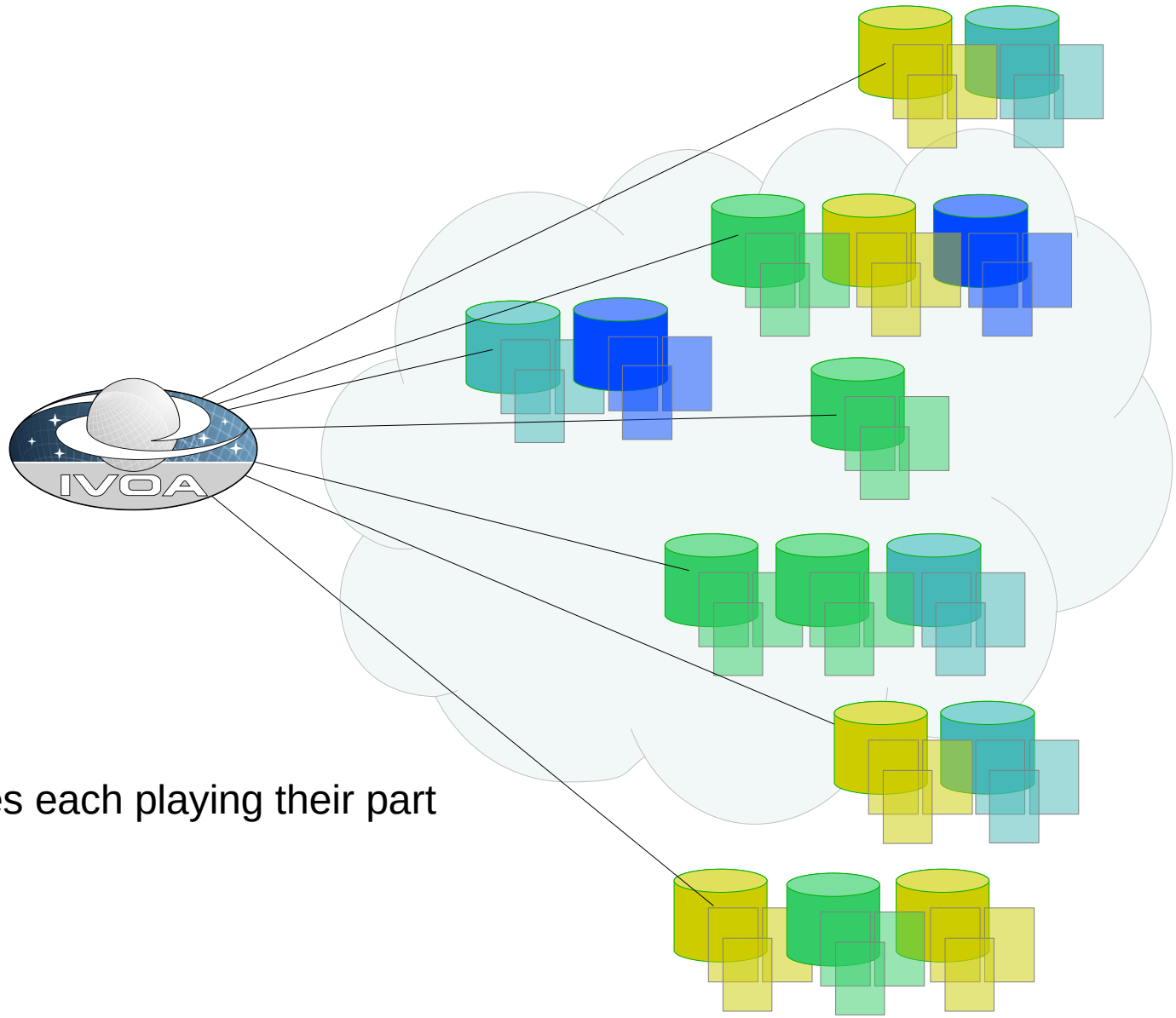

Lots of individual services each playing their part

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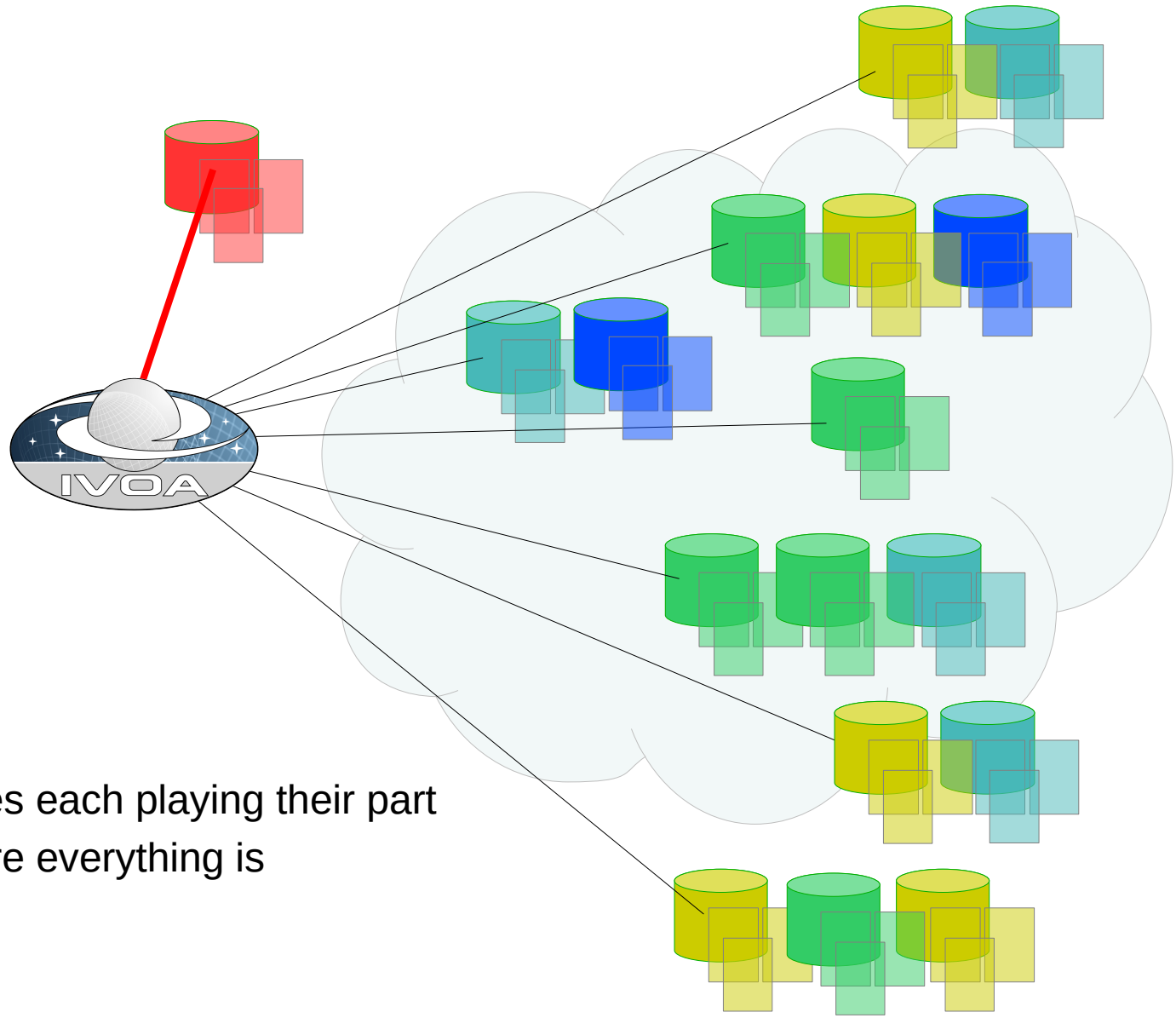

Lots of individual services each playing their part

The registry knows where everything is

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The registry itself is made up of many services

Data is replicated between the nodes

Query any leaf to get the same result

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Cone search

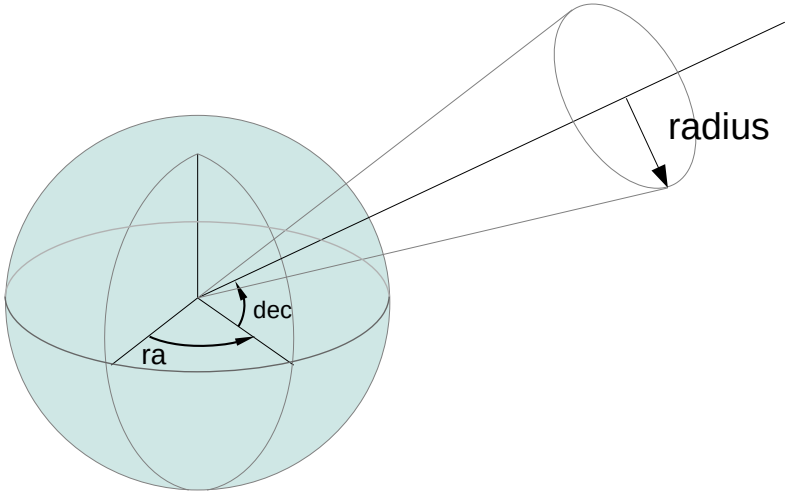
One of the earliest user-facing services define by the IVOA

Version 1.0 adopted as an IVOA recommendation in 2006

RA = 170° (deg)

DEC = 25° (deg)

SR = 30° (deg)



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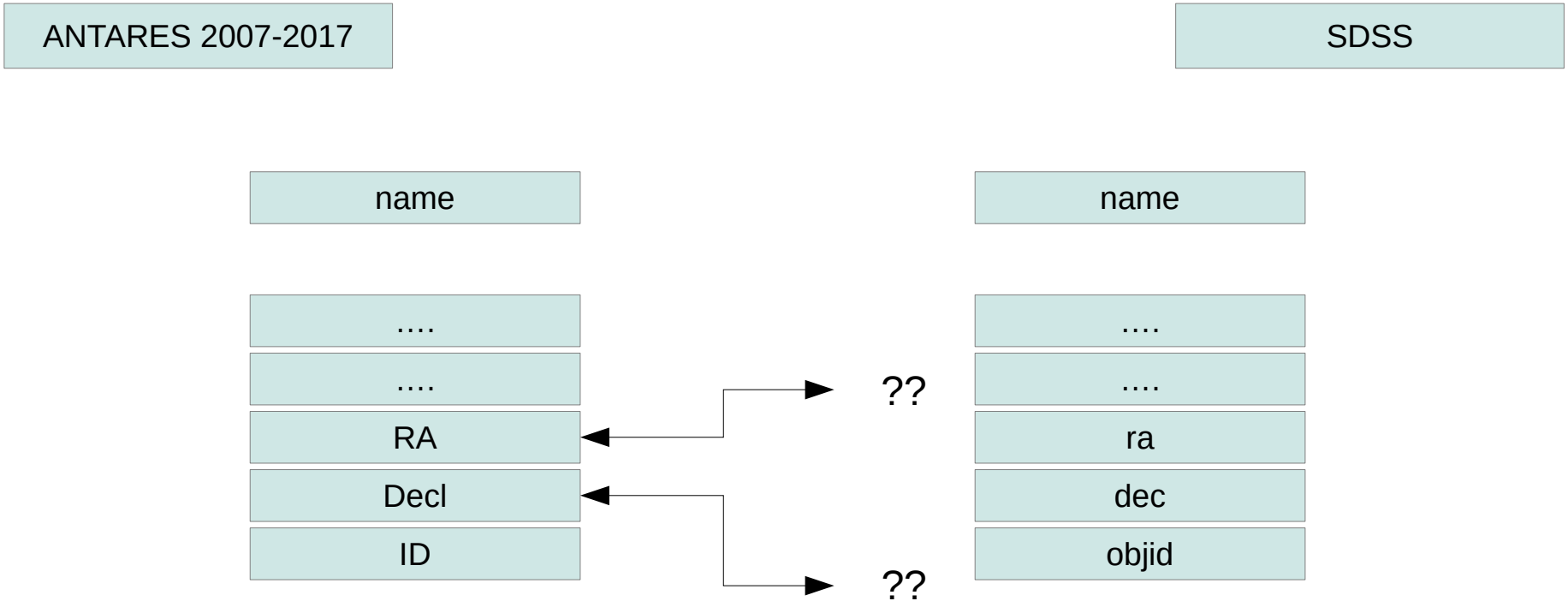

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ANTARES 2007-2017			SDSS
name	UCD	UCD1+	name
….	….	….	….
….	….	….	….
RA	POS_EQ_RA_MAIN	pos.eq.ra;meta.main	ra
Decl	POS_EQ_DEC_MAIN	pos.eq.dec;meta.main	dec
ID	ID_MAIN	meta.id;meta.main	objid

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ANTARES 2007-2017			SDSS
name	UCD	UCD	name
RA	POS_EQ_RA_MAIN	pos.eq.ra;meta.main	ra
Decl	POS_EQ_DEC_MAIN	pos.eq.dec;meta.main	dec

```
CONTAINS(
    POINT('ICRS', sdss.ra, sdss.dec),
    CIRCLE('ICRS', antares.ra, antares.decl, 10./3600.)
    )
```

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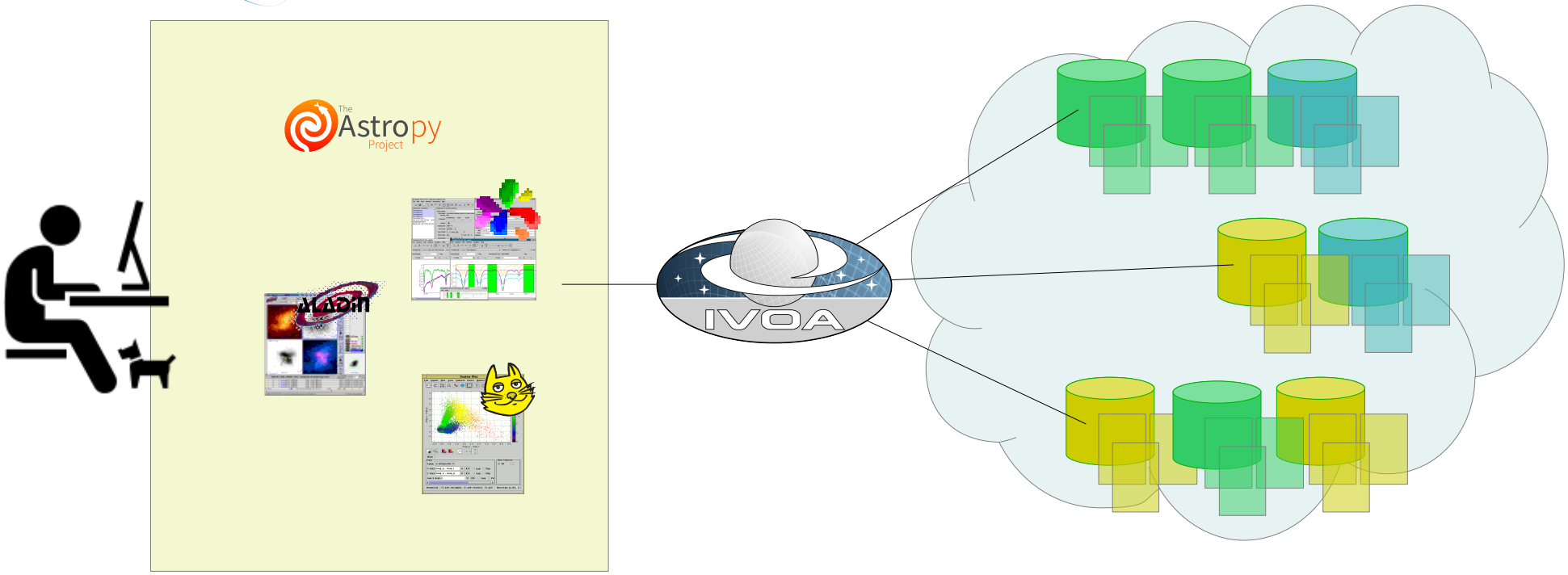

The Virtual Observatory

All the data from the cloud …. available on your desktop

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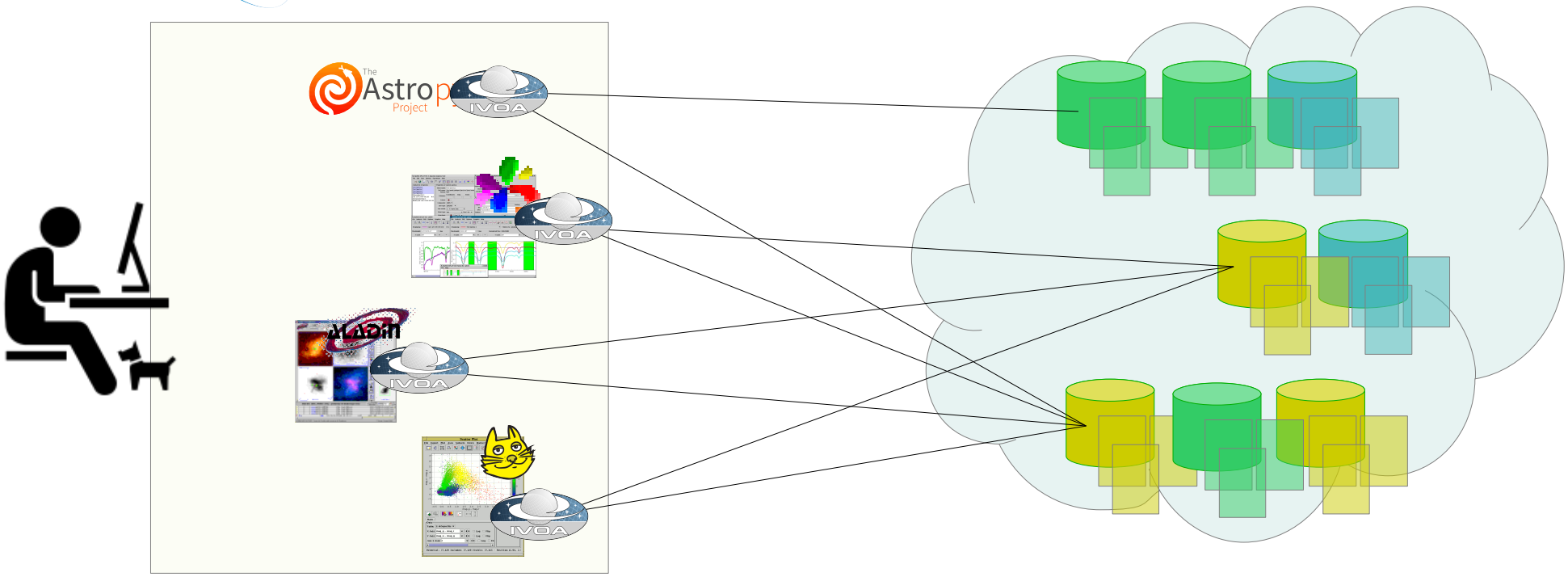

All the data from the cloud …. to each desktop app

Each application maintains its own connection to the VO

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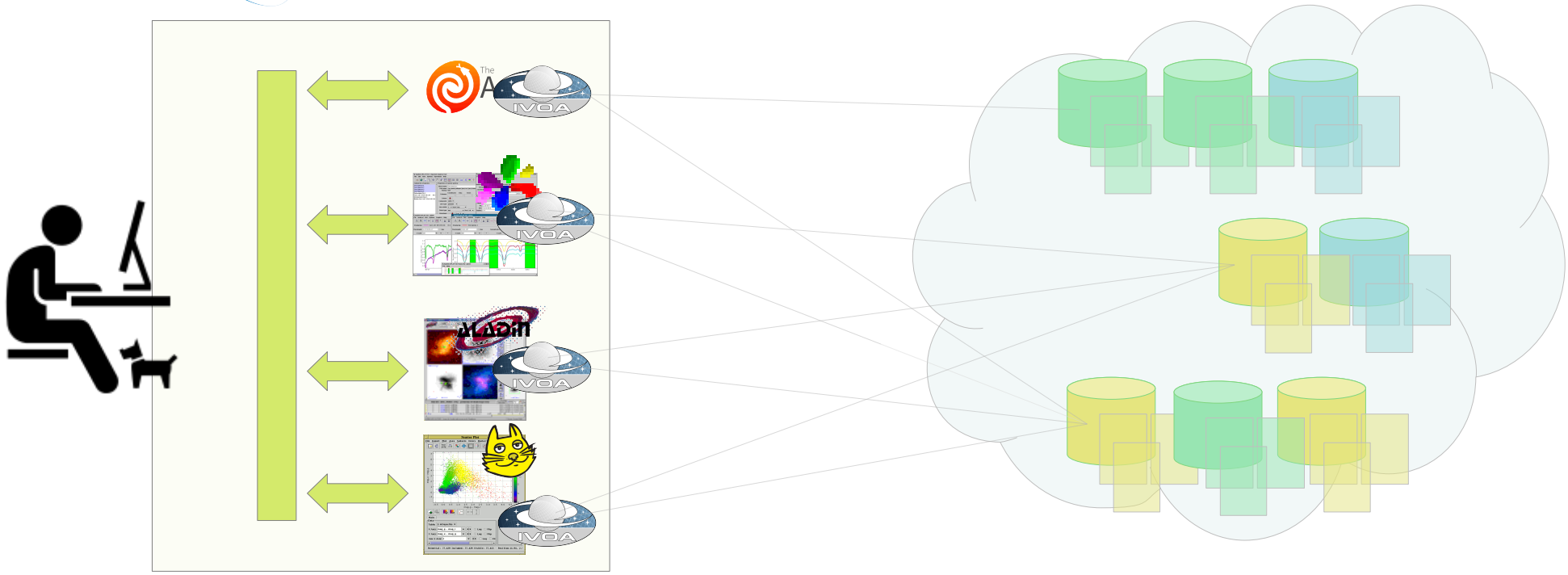

SAMP is a message bus within your local computer

Applications can use SAMP to send messages to each other

table.load.votable <http://example.org/.../table.vot>

image.load.fits <http://example.org/.../image.fits>

coord.pointAt.sky <ra,dec>

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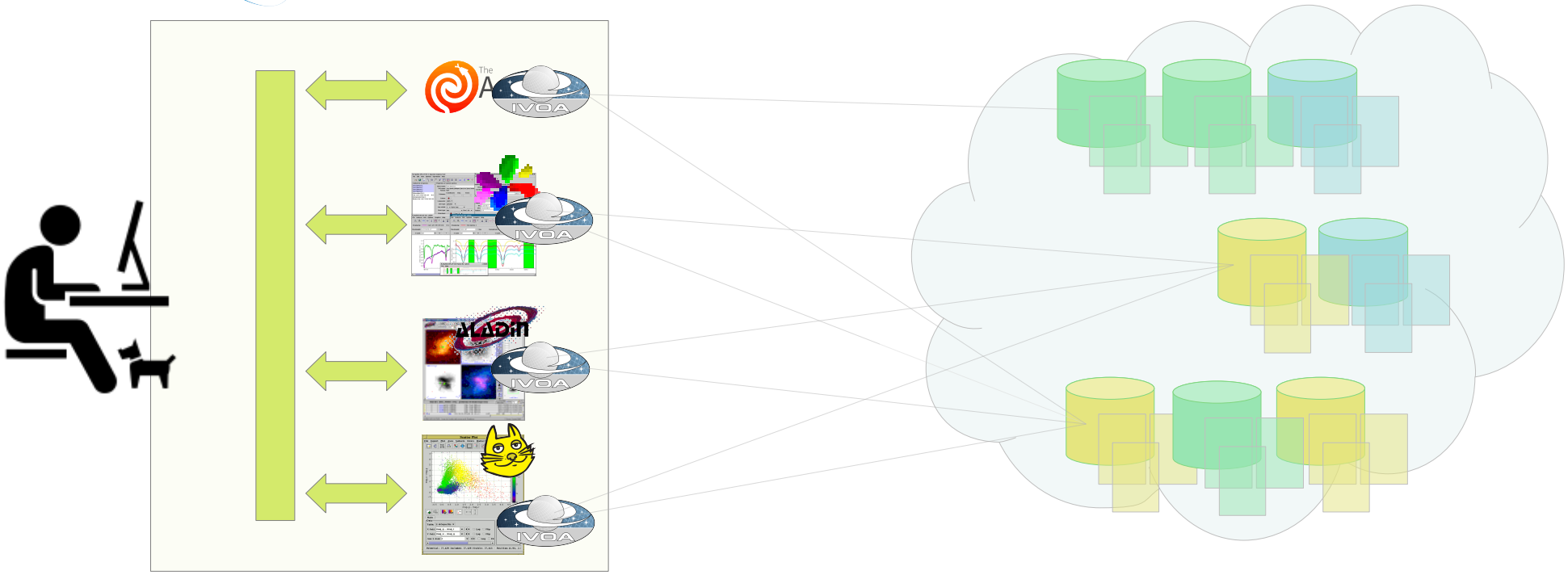

Messages can be sent to specific applications

Send to Aladin:

image.load.fits <http://example.org/.../image.fits>

Or broadcast to all listeners

Send to all:

coord.pointAt.sky <ra,dec>

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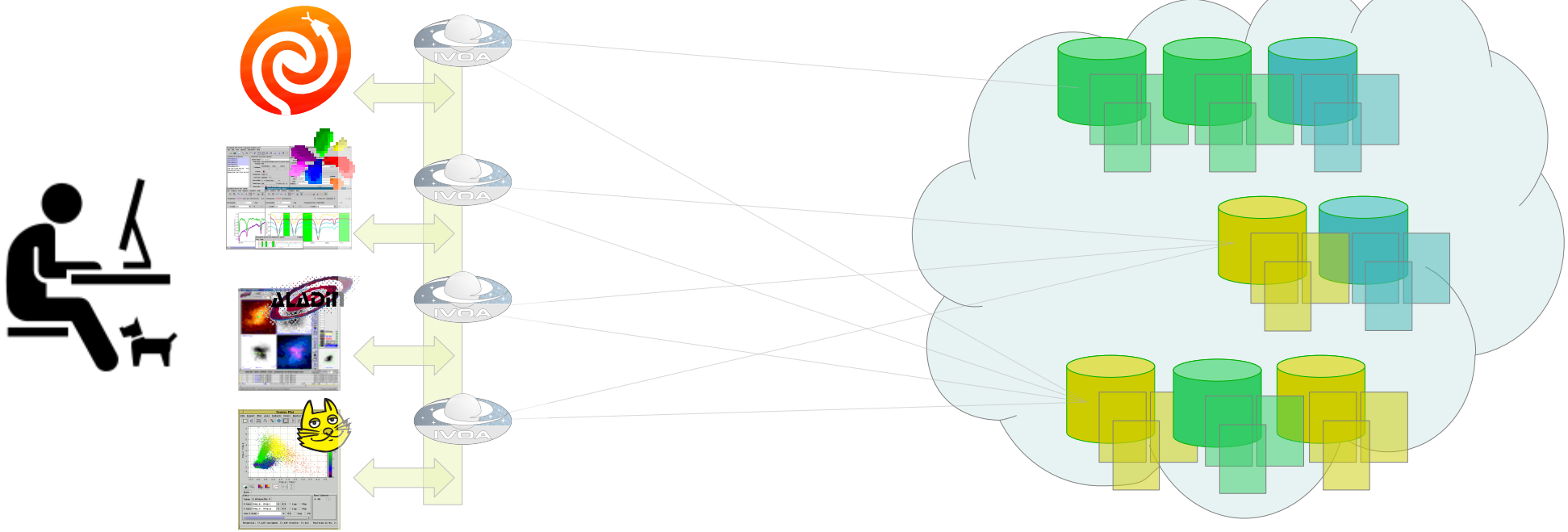

The Virtual Observatory

If we have done our job right, all the details disappear

All the data from the cloud …. available on your desktop

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Everyone invited to develop science use cases

Science based interest groups

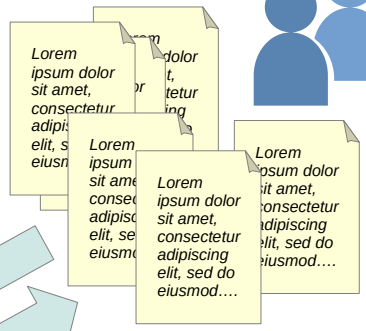
Scientific use cases

transients

time-series

IVOA working groups e.g. DataAccessLayer, Applications, Semantics

Working group email list



Everyone invited to discuss

New standards being developed

ObjVisSAP ObsLocTAP

TIMESYS Multi-order Coverage (MOC)

Hierarchical Progressive Surveys (HiPS)

Science priorities for the IVOA

Science platforms

Machine learning

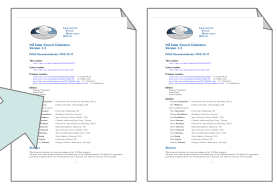
Multi-messenger astronomy

Science priorities committee

Scientists from IVOA members and major astronomy projects

Request For Comment (RFC) document

IVOA recommendation



Everyone invited to comment

Anyone can raise issues

GitHub

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