Describing and finding VOEvent streams

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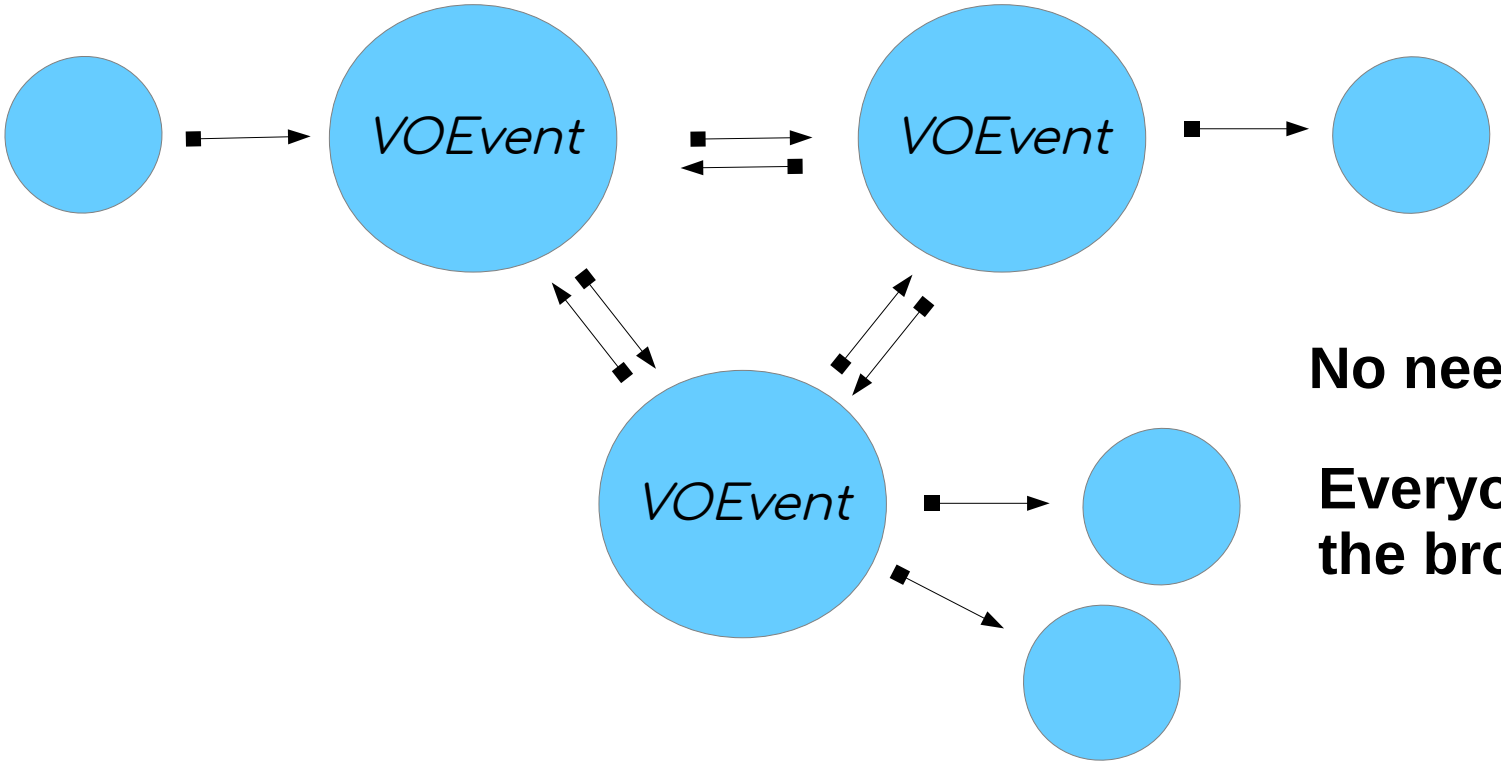
IVOA interop meeting
Observatoire de Paris, May 2019

Network of brokers broadcasting events



No need for discovery

Everyone just knows the broker endpoints

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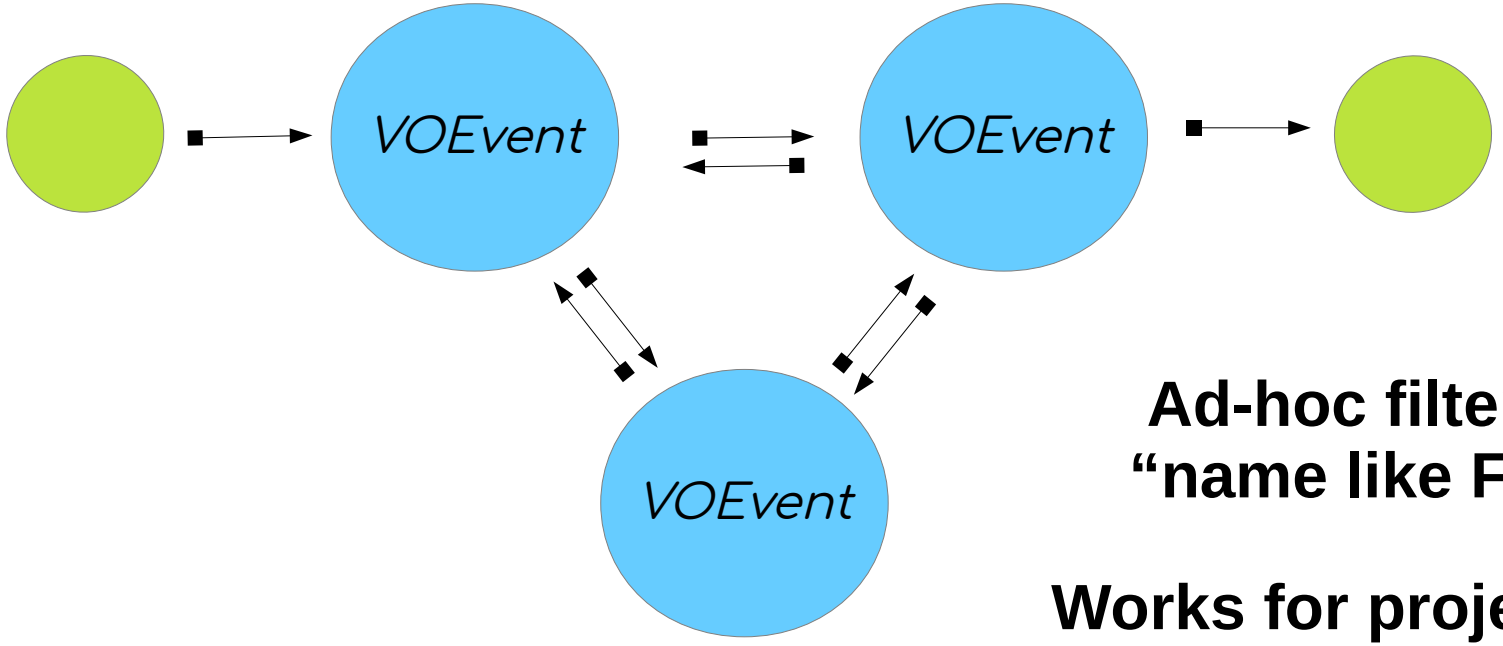
Project specific event types

VOEvent for Fast Radio Bursts
arXiv:1710.08155v1 [astro-ph.IM]



Ad-hoc filtering
“name like FRB*”

Works for projects < 10

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Where we are now

VOEventRegExt:

An XML Encoding Schema for Resource Metadata for Collections of Events

Version 1.0

IVOA Working Draft

13 May 2014

Is anyone using this ?

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VOEventRegExt:

“… each VOEventStream has a defined set of named ‘parameters’, and each event that is a member of the stream should use only parameters that are selected from the list in the stream definition.”

Event type definitions :-)

Is anyone using this ?

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VOEventRegExt:

If a server supports a subscription capability with filtering, it means that a client can submit a criterion

("R magnitude brighter than 17")

and events will be delivered by the server in the future which satisfy that criteria.

**** As far as I know, filtering is not defined in any service standard.**

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Going back to the community :

Do you want to register and discover streams ?

“Kind of, but running a registry is too heavy for what we need.”

What do you use for the IVOID identifiers ?

“We just made something ourselves.”

**** lightweight *‘registry in a container’* would go along way to help solve this**

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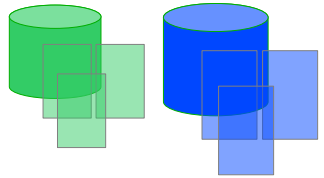
Large Synoptic Survey Telescope

APACHE kafka

Community broker



High data rate (> 10^3 Hz)

crossmatch
characterization
annotation
filtering

High value, well characterized events

e.g. 80% probability supernova candidate

Low data rate (10 per day ?)

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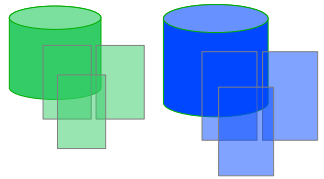
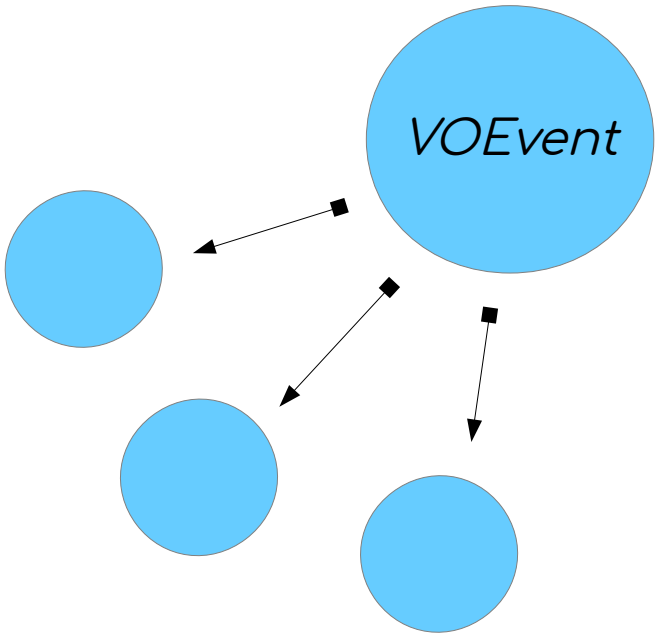
APACHE kafka

Community broker



crossmatch
characterization
annotation
filtering

High data rate (> 10^3 Hz)



IVOA VOEvent format

Existing VOEvent community

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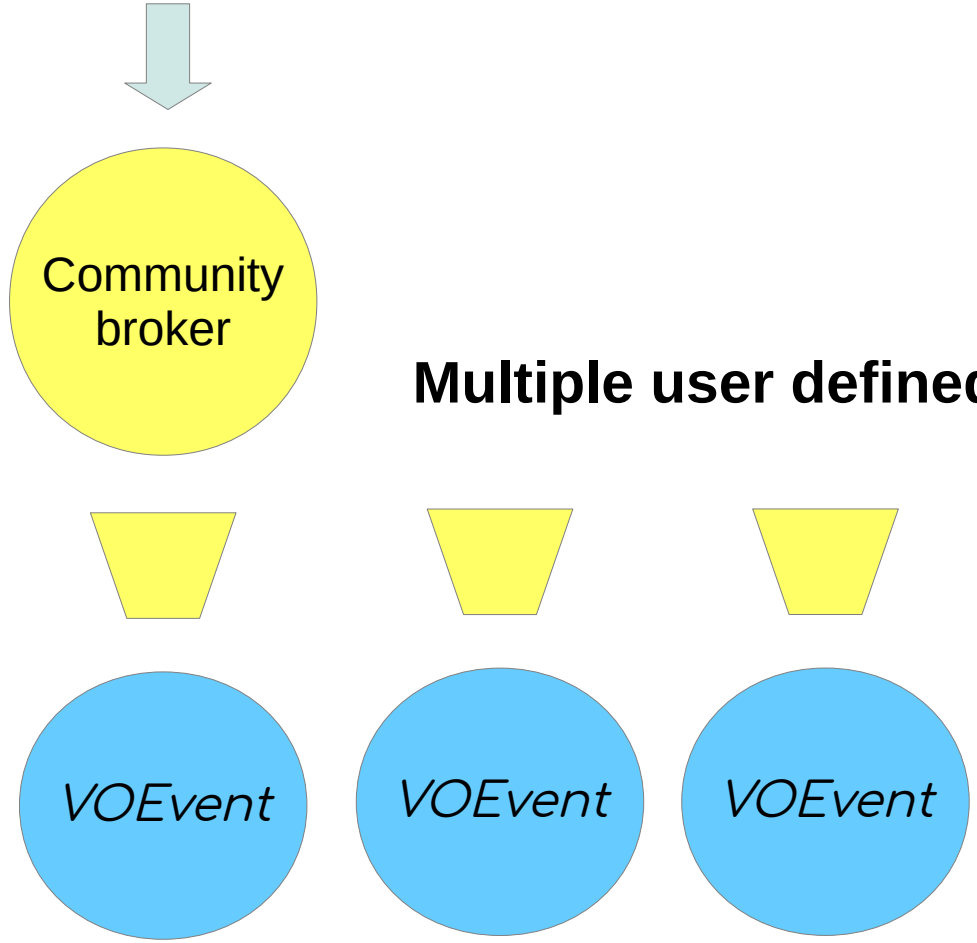
One community broker
e.g. Lasair at Edinburgh

Lasair

https://lasair.roe.ac.uk/



Multiple user defined filters

Multiple streams of filtered data

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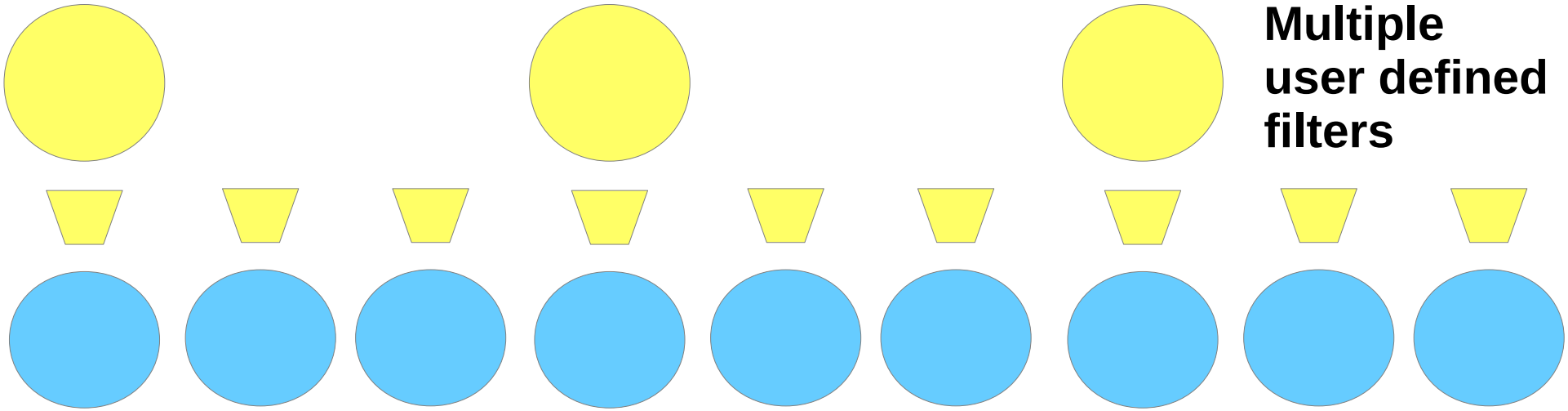
Multiple community brokers (n ~ 5)



Multiple user defined filters

Multiple streams of filtered data

Broad spectrum of quality and accuracy

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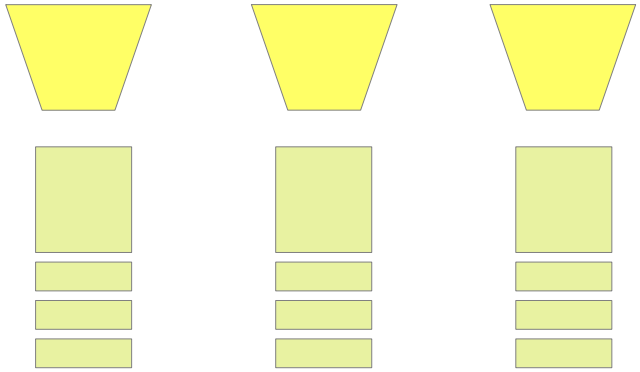
Multiple different filters



Each stream is a table with no end

Describe them the same way we describe tables

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Going back to the community :

Do you want to discover streams ?

Yes, I want to explore what is available.

No, users will learn where the important streams are from published papers.

(*) we will still need to discover technical details like transport protocol, event type and properties.

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Going back to the community :

How would you want to describe streams ?

- Area of sky – footprint, MOC ?
- Type of phenomenon – vocabulary (extensible) ?
- Primary source (instrument)
- Upstream source (another filter)
- Processing algorithm
- Probability of classification

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Going back to the community :

How would you want to describe streams ?

Area of sky – footprint, MOC ?

** VOEvents use a range of different coordinate systems
Do we just use ICRS ?

** What about solar system objects ?

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Going back to the community :

How would you want to describe streams ?

Type of phenomenon – extensible vocabulary ?

**** According to the arXiv, there are >50 types of FRBs**

http://multi-messenger.asterics2020.eu/Documents/presentations/Hessels_Jason.pdf

Can semantics help us with this ?

Some event streams are about things with no name (or many names) that we don't quite understand yet.

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Thanks

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