

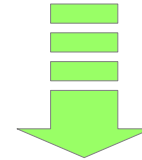
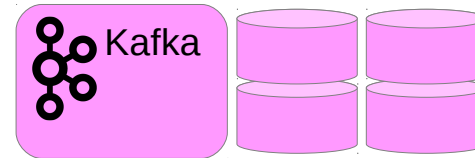
# LSST / ZTF

## Event stream processing

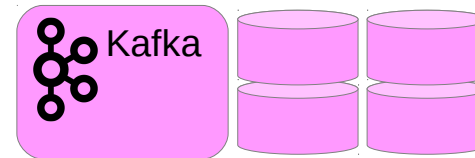
### Non-technical (technical) overview

Dave Morris  
LSSTUK - Lasair workshop  
Edinburgh  
October 2018

Kafka stream – ZTF/LSST

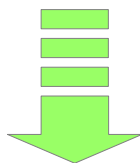
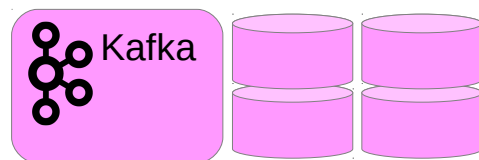


Kafka mirror - Edinburgh

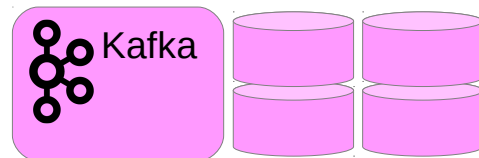


## Target data rates

Kafka stream – LSST



Kafka mirror - Edinburgh



LSST firehose

minimum  $10^4$  events per visit (40 sec)      4ms/event

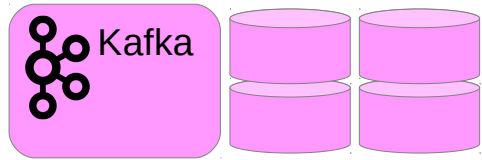
target  $4 \times 10^4$  events per visit (40 sec)      1ms/event

stretch  $10^5$  events per visit (40 sec)      400 $\mu$ s/event

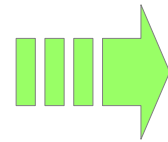
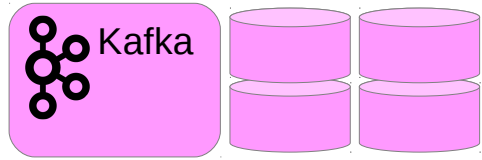
This is not what you will get as science output.

This is what we are building the system to handle.

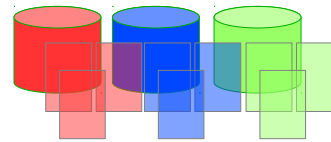
Kafka stream – ZTF/LSST



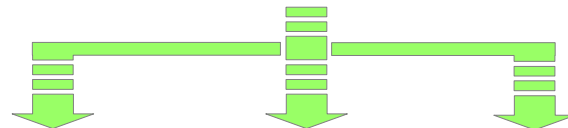
Kafka mirror - Edinburgh



Database cross-match



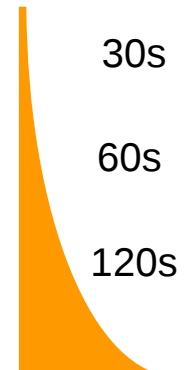
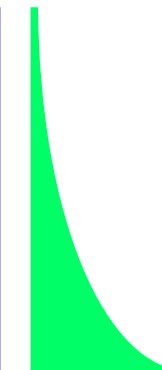
User defined filters



data rate  
1kHz .. 10kHz

complexity  
400μs .. 1ms

latency  
30s



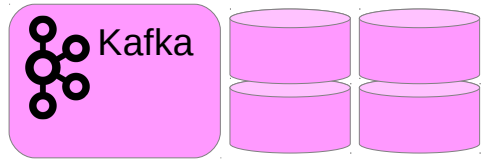
1Hz .. 10Hz

1s .. 10s

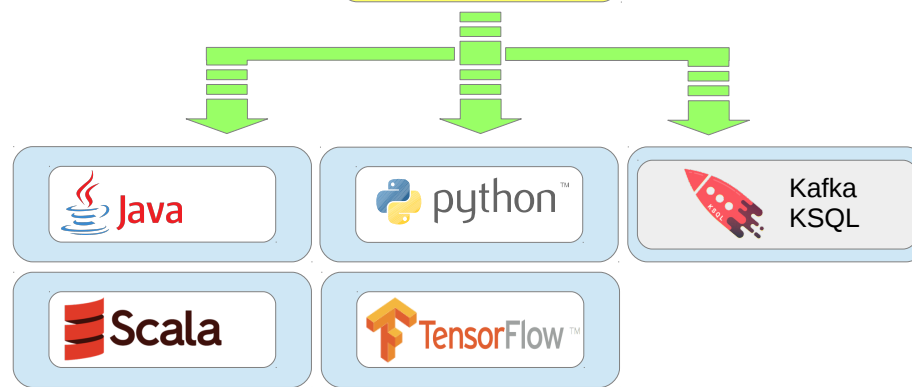
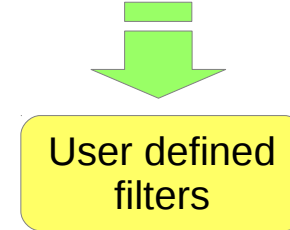
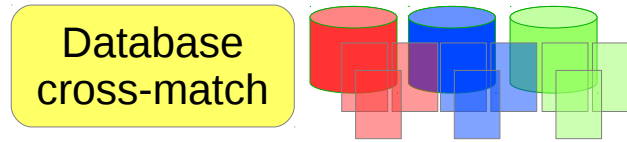
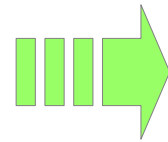
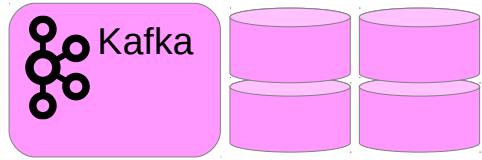
240s +



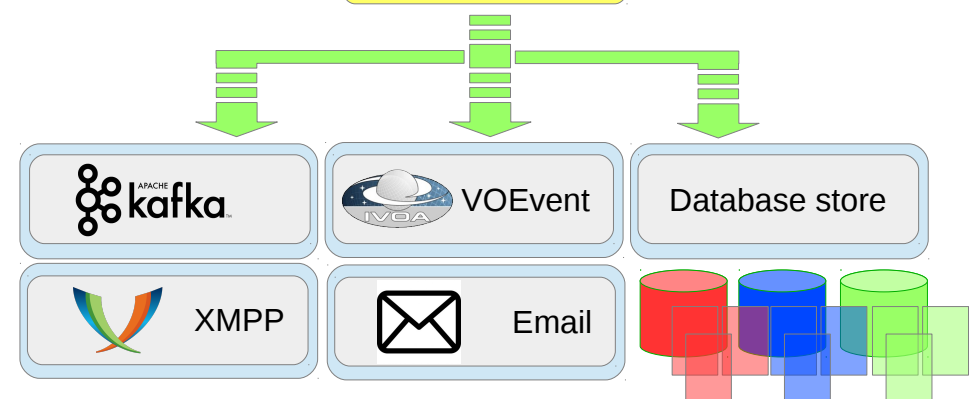
Kafka stream – ZTF/LSST



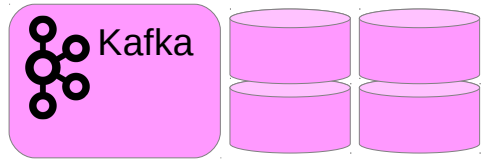
Kafka mirror - Edinburgh



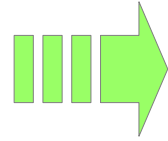
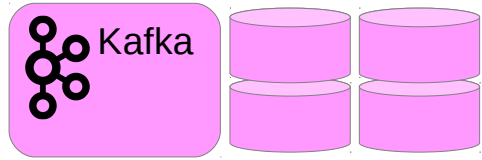
Outputs



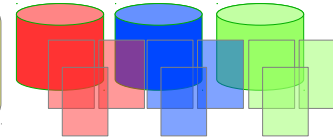
Kafka stream – ZTF/LSST



Kafka mirror - Edinburgh

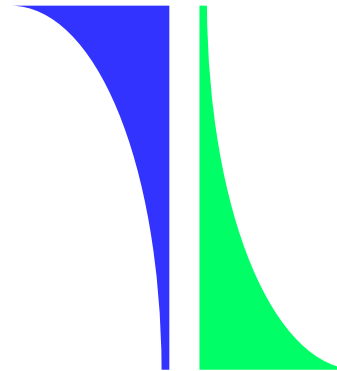


Watchlist  
cross-match



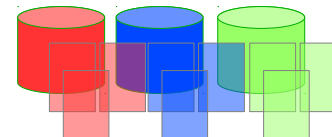
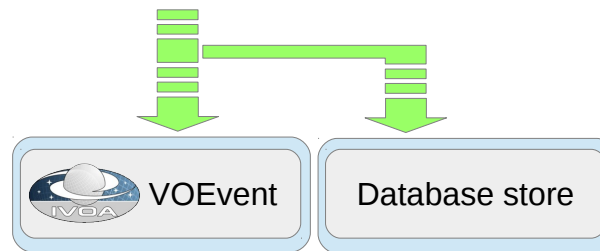
1kHz .. 10kHz

data rate

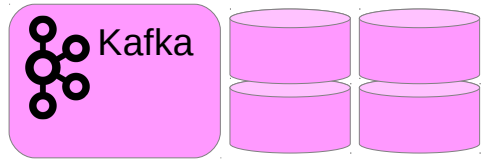


1Hz .. 10Hz

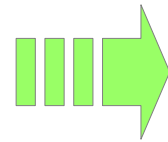
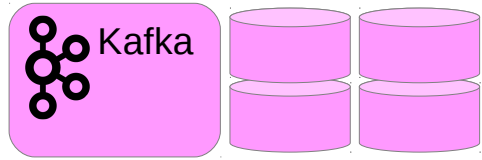
complexity



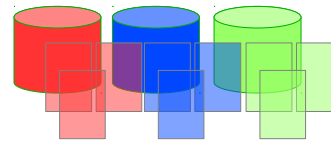
Kafka stream – ZTF/LSST



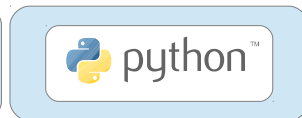
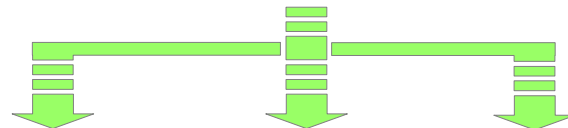
Kafka mirror - Edinburgh



Database cross-match



User defined filters



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