

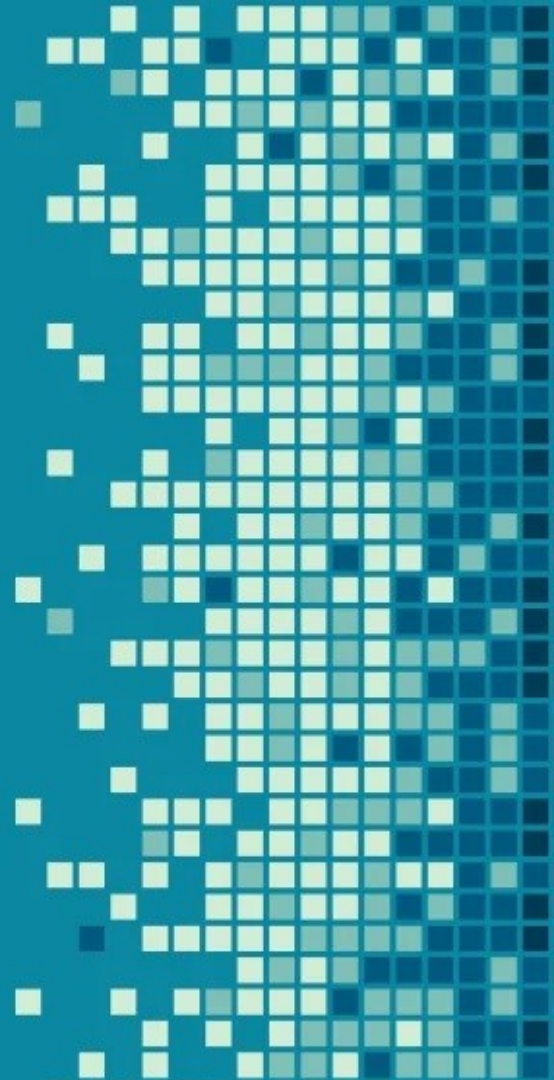
Reactive Streams

Non-blocking asynchronous stream
processing with back-pressure

Jordan Parmer
@profparmer

What's Reactive Streaming?

“ Common
mechanism to move
data across an
asynchronous
boundary without
losses, buffering, or
resource
exhaustion

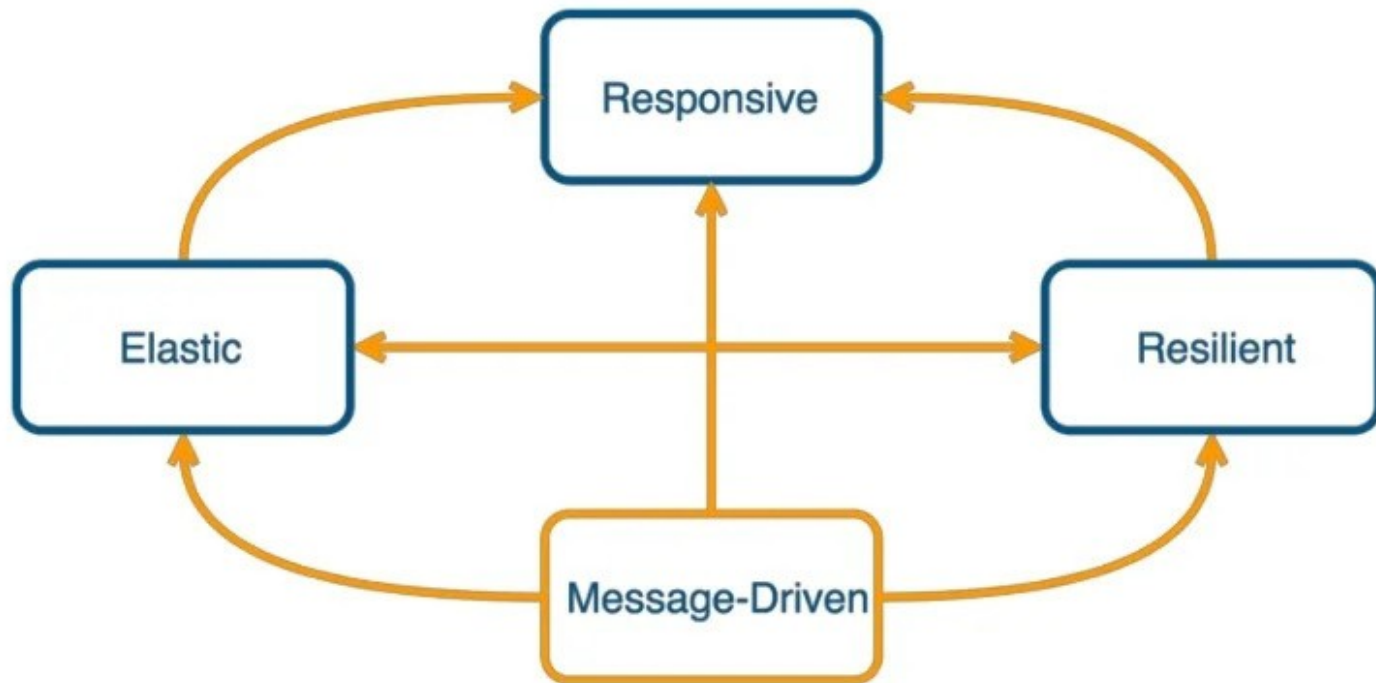


Common Use Cases

- Data pipeline processing
 - Unbounded data volume
- Message queue streaming
- Network streaming
- File streaming

Reactive Programming vs Reactive Systems

Reactive Systems

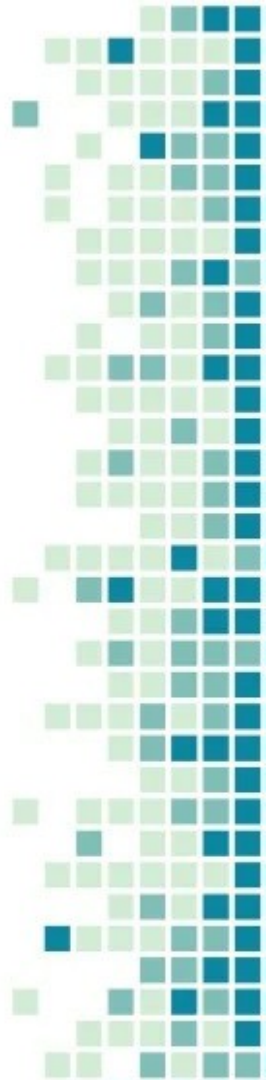


Reactive Programming Systems

- Application-view
- CPU's, threads, local resources
- Per-process execution
- Event-driven

Reactive

- Systems-view
- Process interaction
- Cohesion of parts
- Message-driven



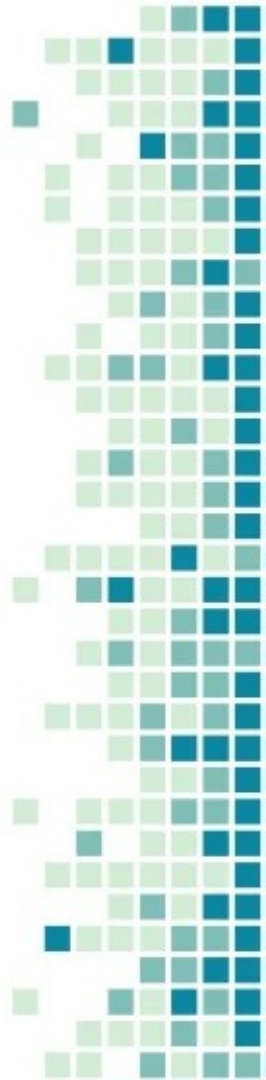
Reactive Programming Systems

- Application-view
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We are
talking about
this

Reactive

- Systems-view
- Process interaction
- Cohesion of parts
- Message-driven

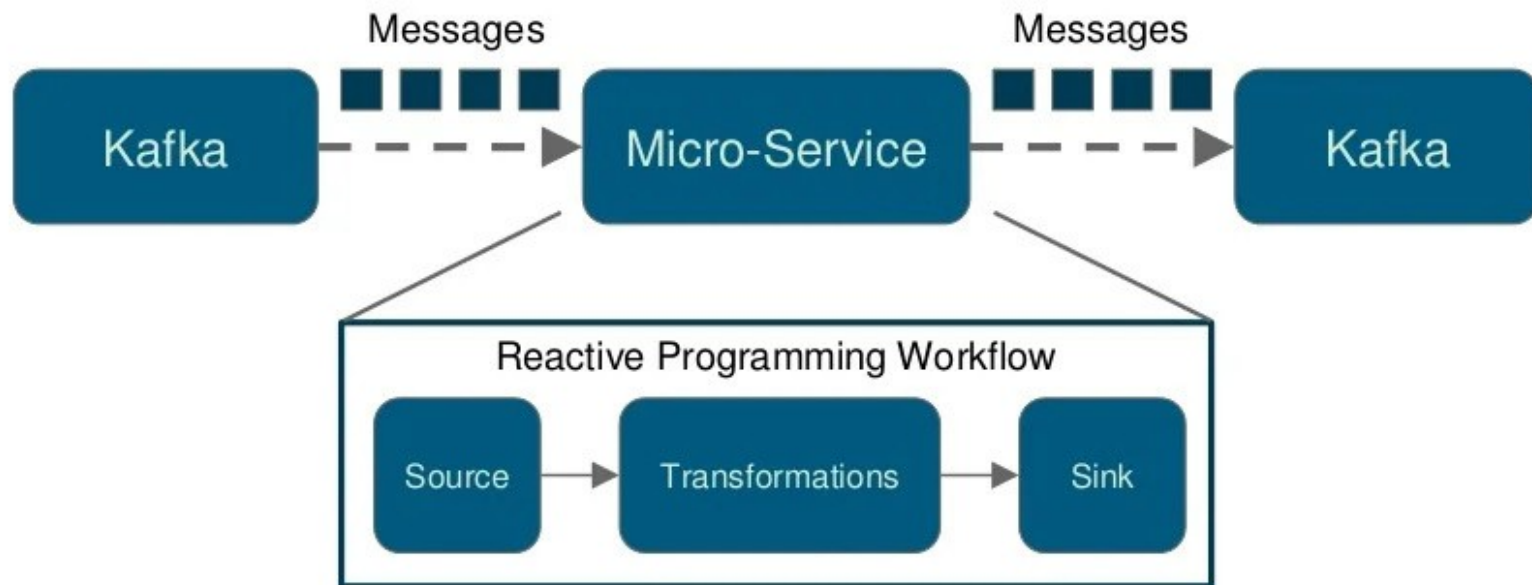


How We Use It

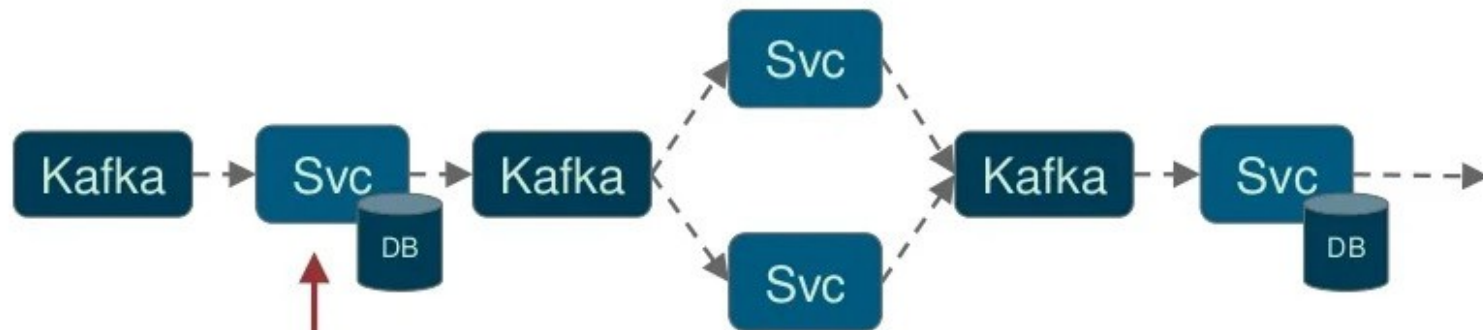
Oseberg Use Case



Oseberg Use Case



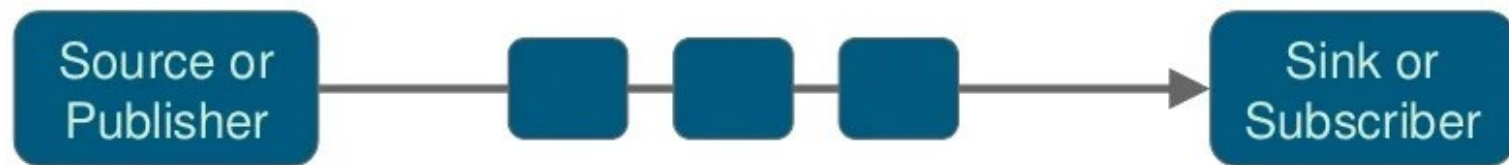
Oseberg Use Case



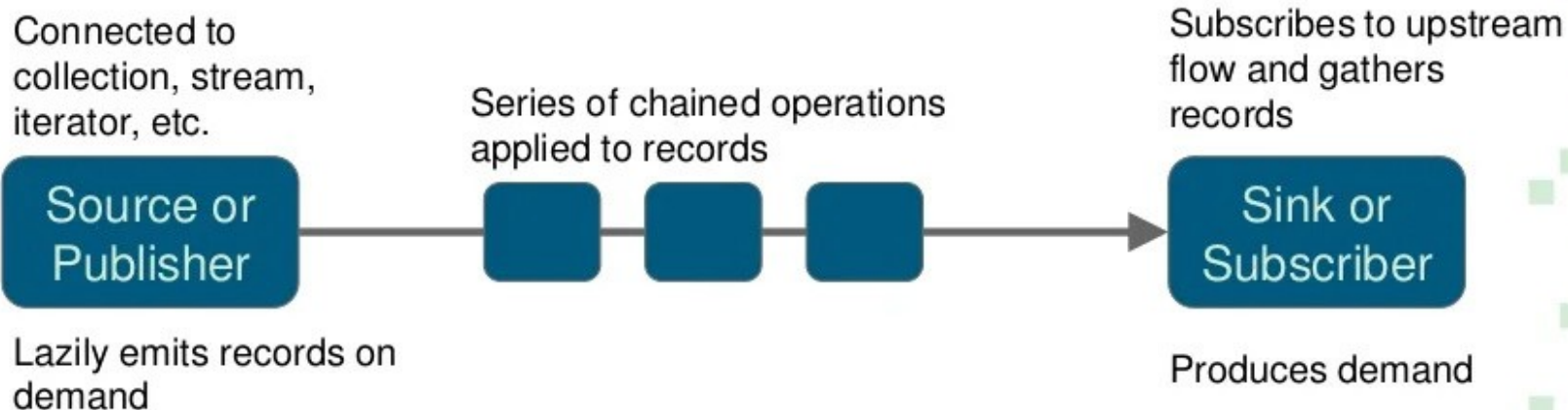
Each service internally uses Reactive Streams API to read from Kafka, transform messages, write to storage (if necessary), and write to Kafka.

Akka Streams API

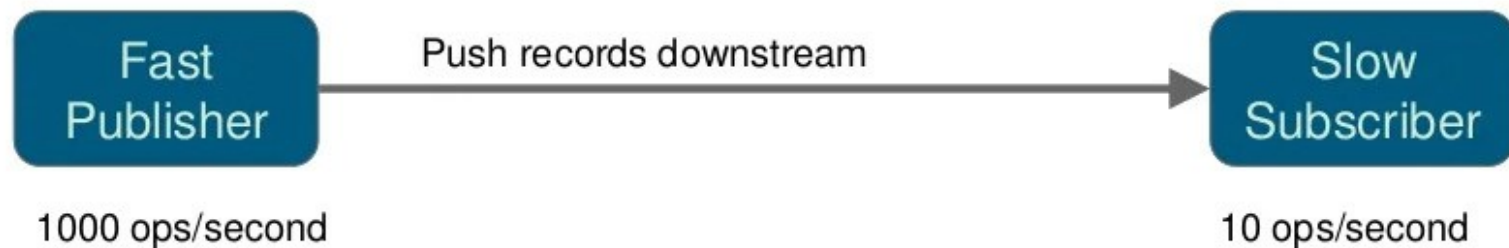
General Workflow



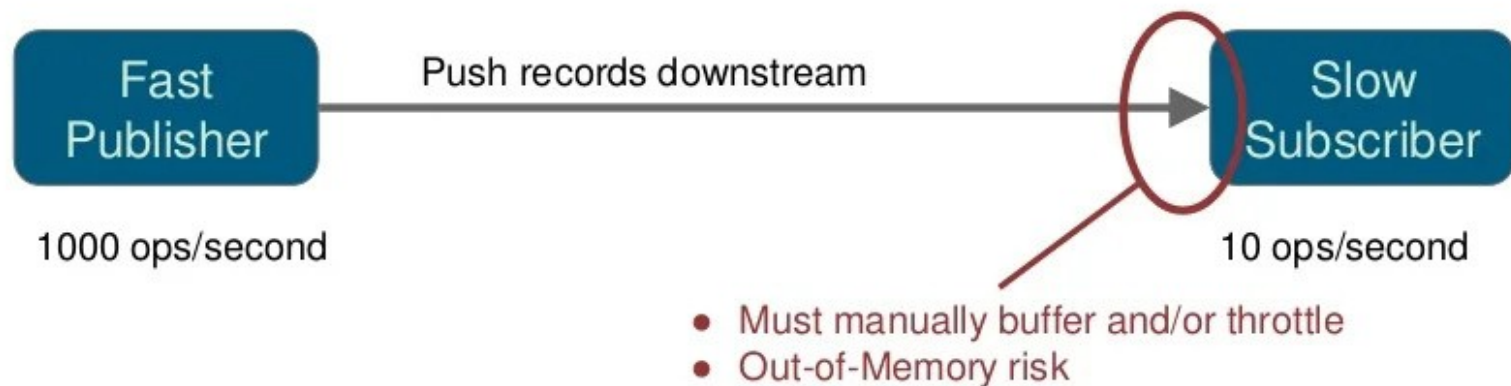
General Workflow



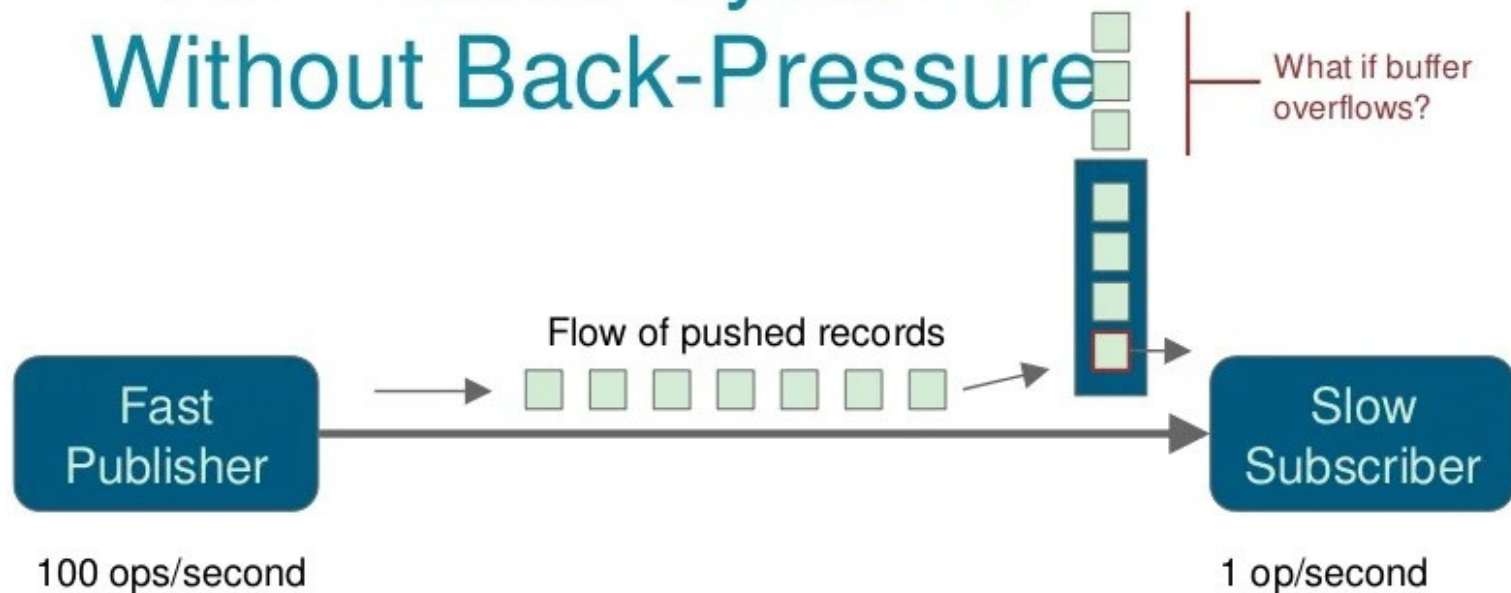
Push-Based Systems Without Back-Pressure



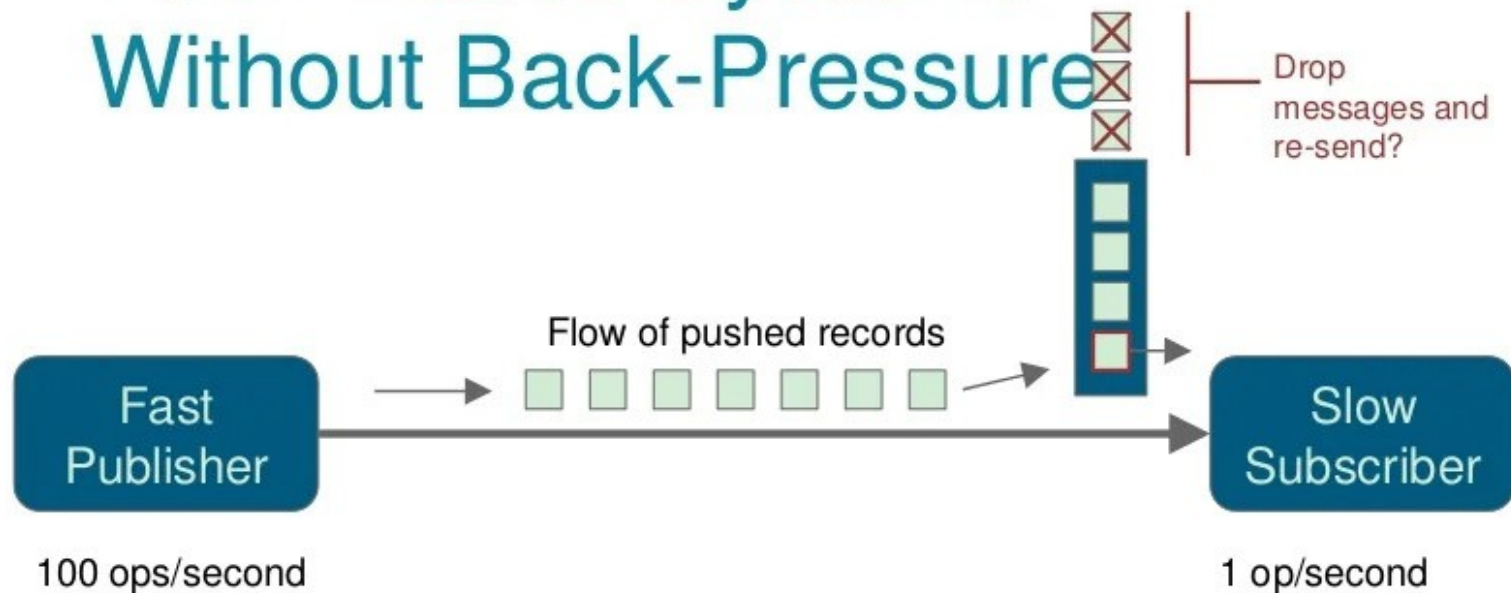
Push-Based Systems Without Back-Pressure



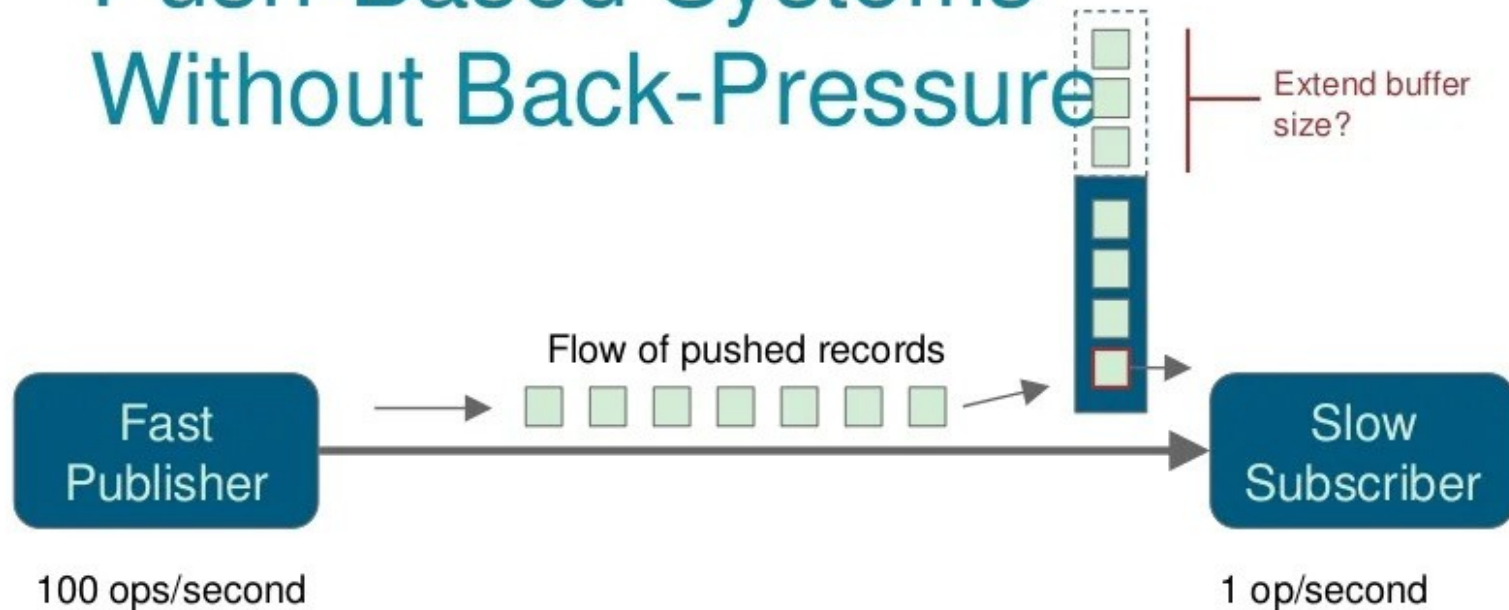
Push-Based Systems Without Back-Pressure



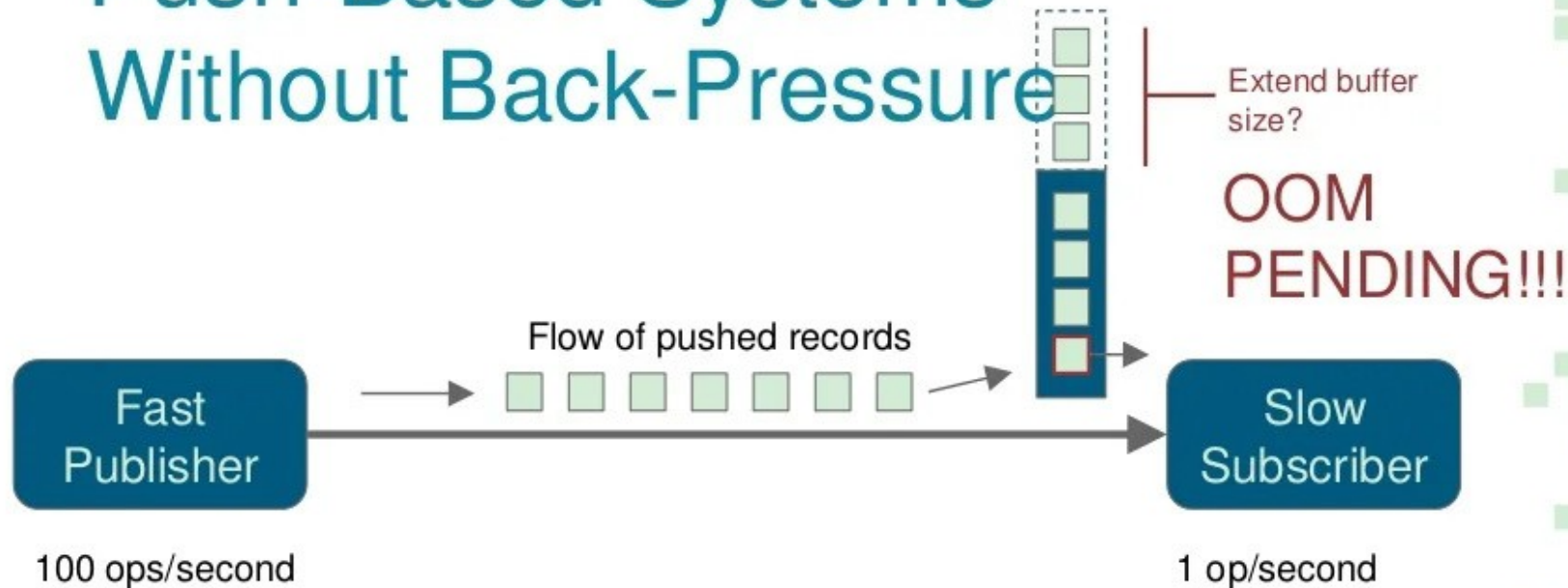
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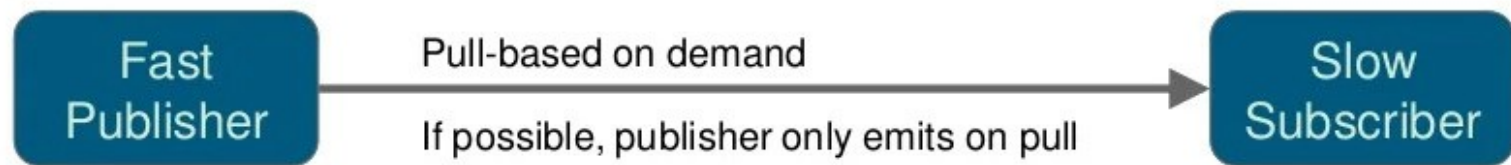
Push-Based Systems Without Back-Pressure



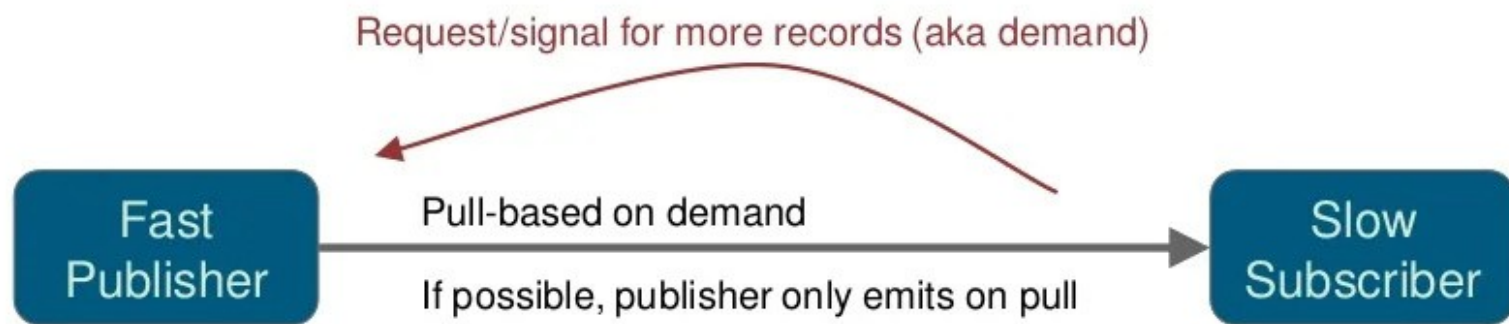
Push-Based Systems Without Back-Pressure



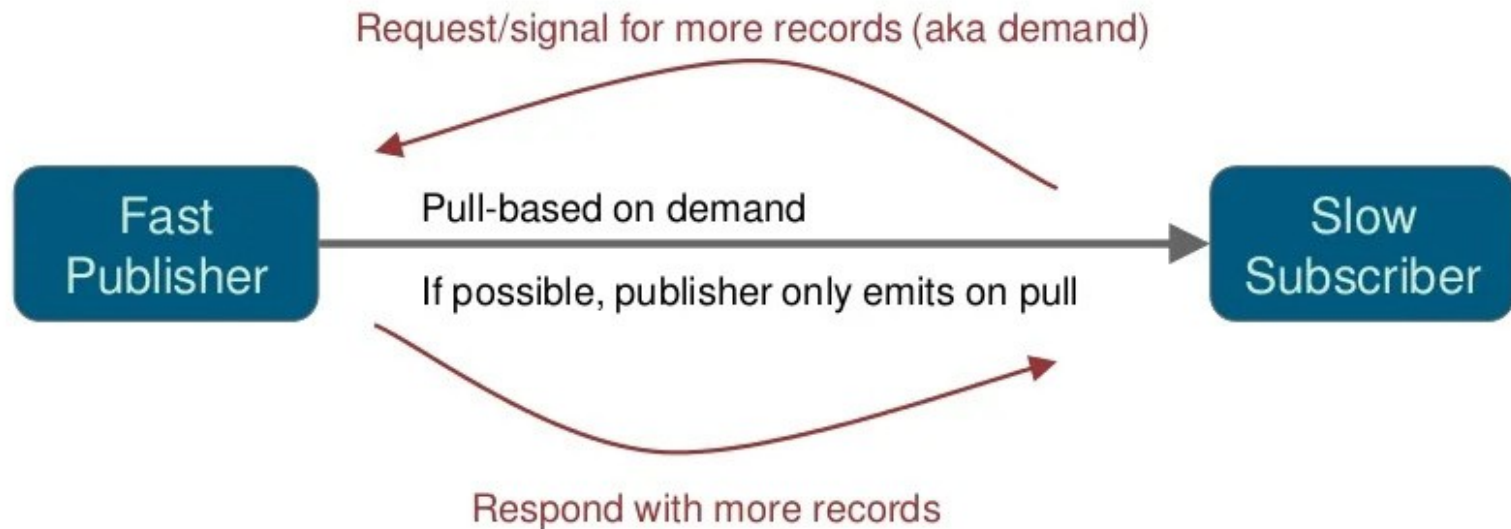
Reactive With Back-Pressure



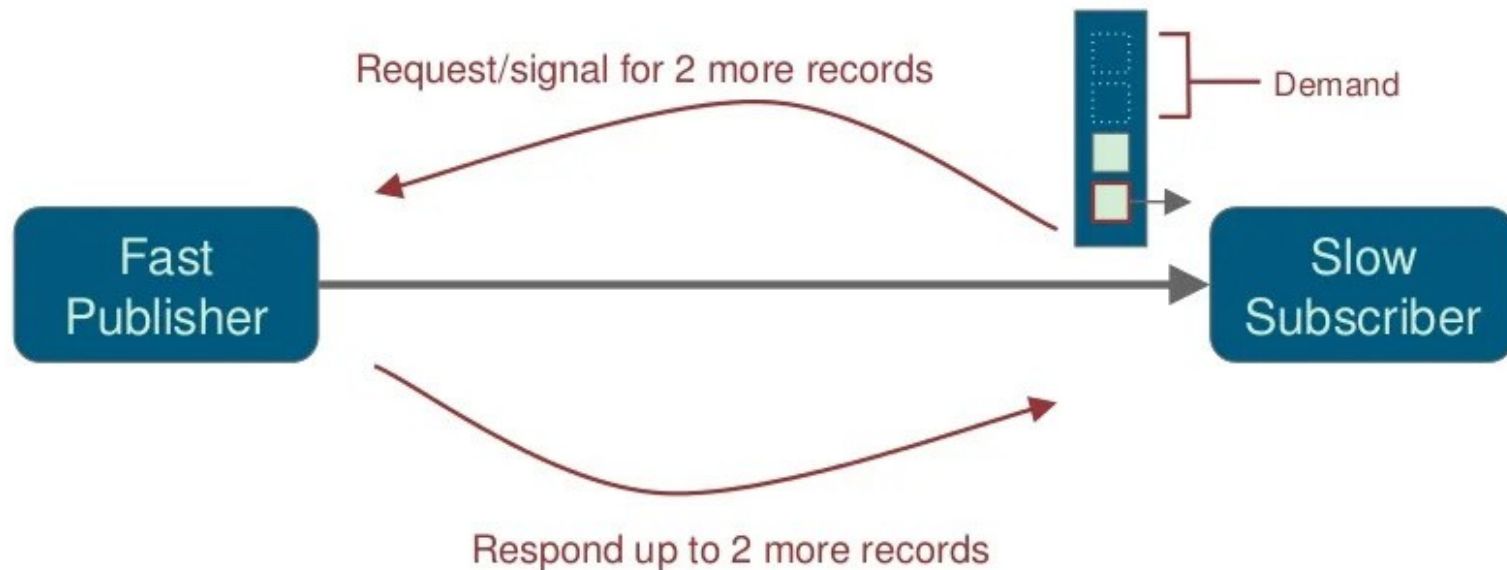
Reactive With Back-Pressure



Reactive With Back-Pressure

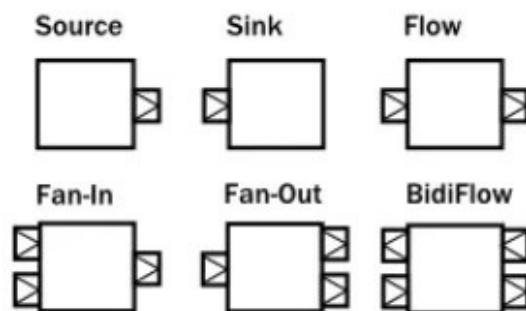


Reactive With Back-Pressure



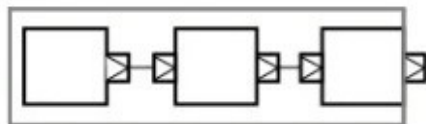
Example

Composability

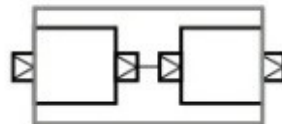


Composability

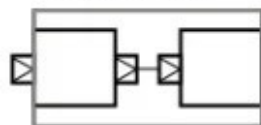
Composite Source



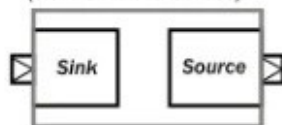
Composite Flow



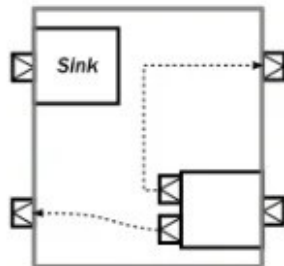
Composite Sink



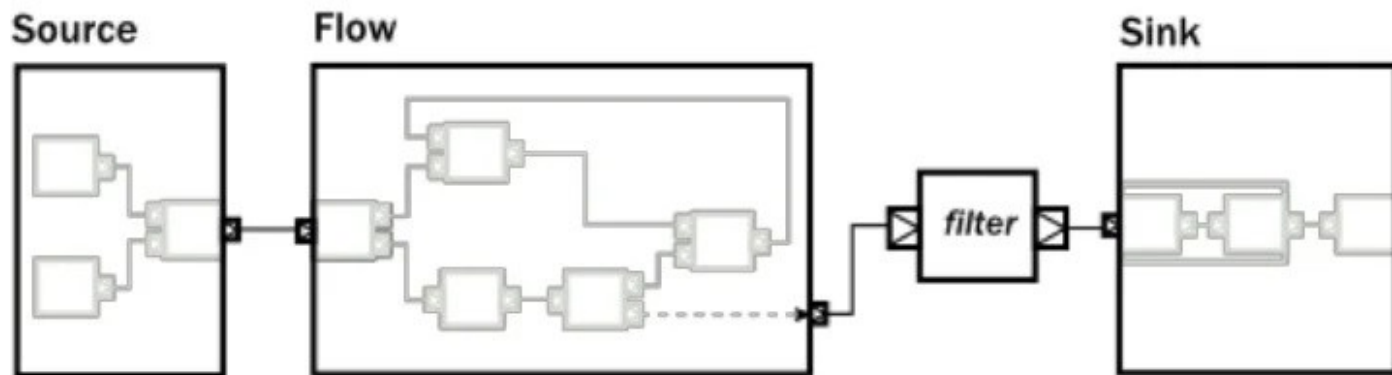
Composite Flow
(from Sink and Source)



Composite BiDiFlow

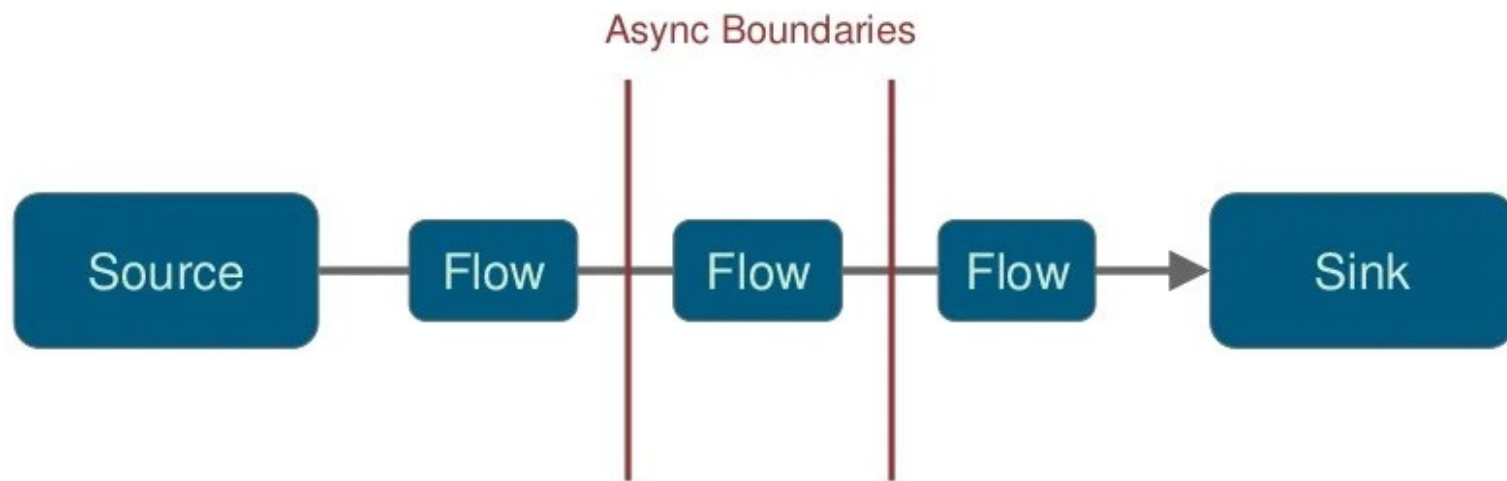


Composability

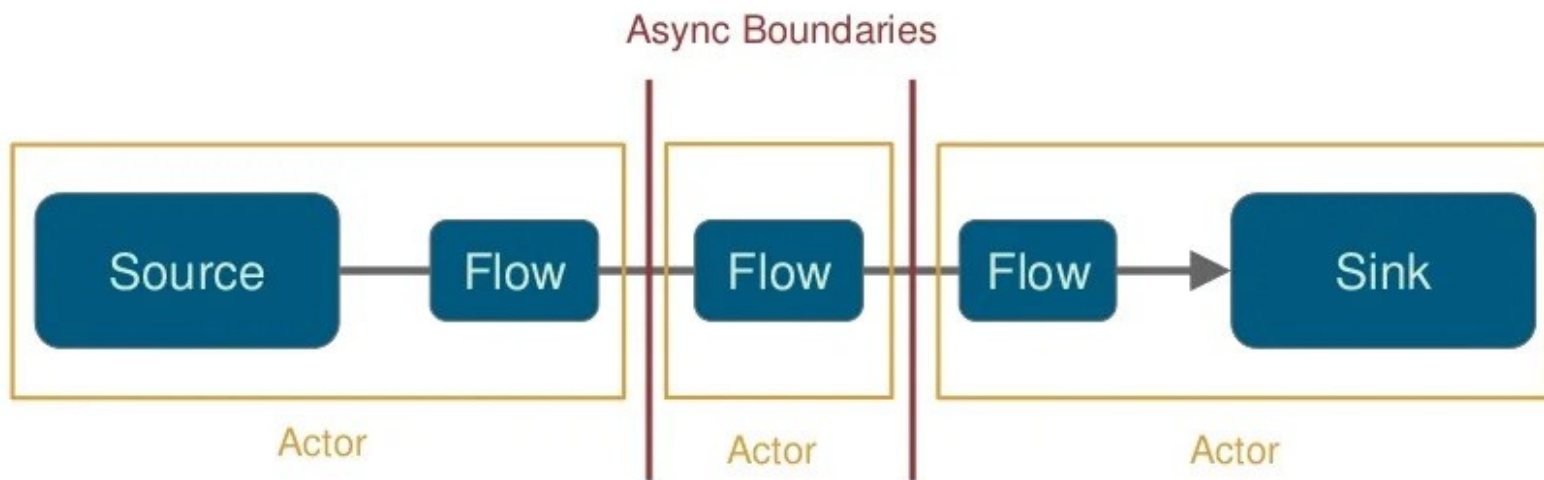


Example

Asynchronous Boundaries



Asynchronous Boundaries



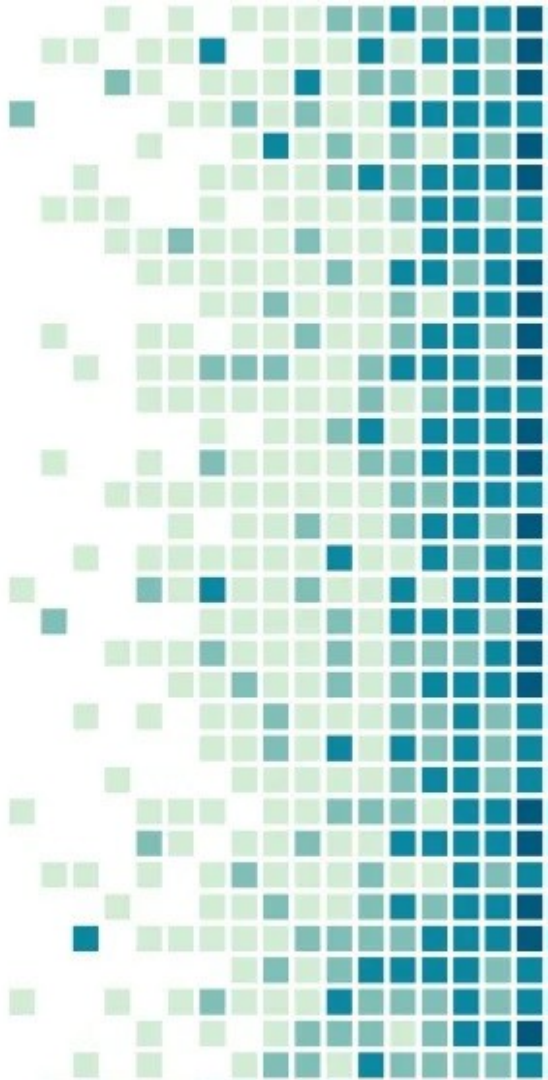
Example

Enterprise Integrations

Alpakka

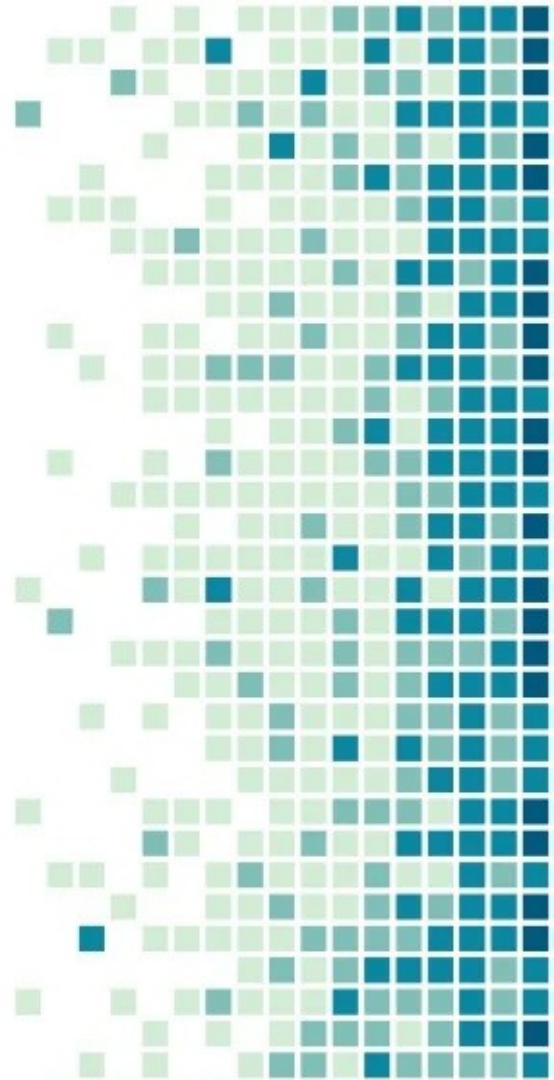
Enterprise Integration

<https://github.com/akka/alpakka>



Akka Streams Kafka

Reactive Kafka API



Example

Questions?

Twitter @profparmer