Implementing Advanced Kinesis Consumers

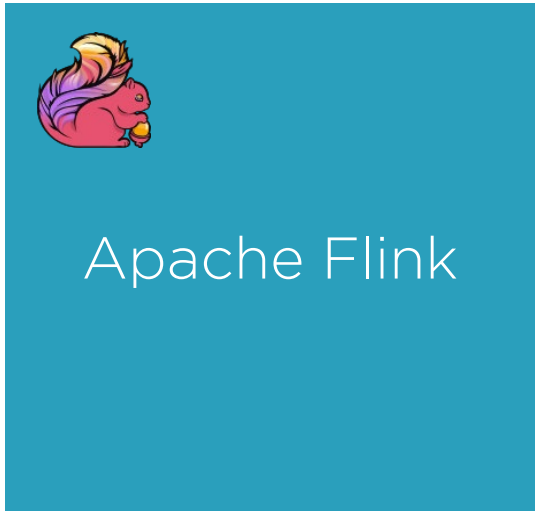
Ivan Mushketyk

@mushketyk brewing.codes

Overview

Library to integrate Kinesis with other services

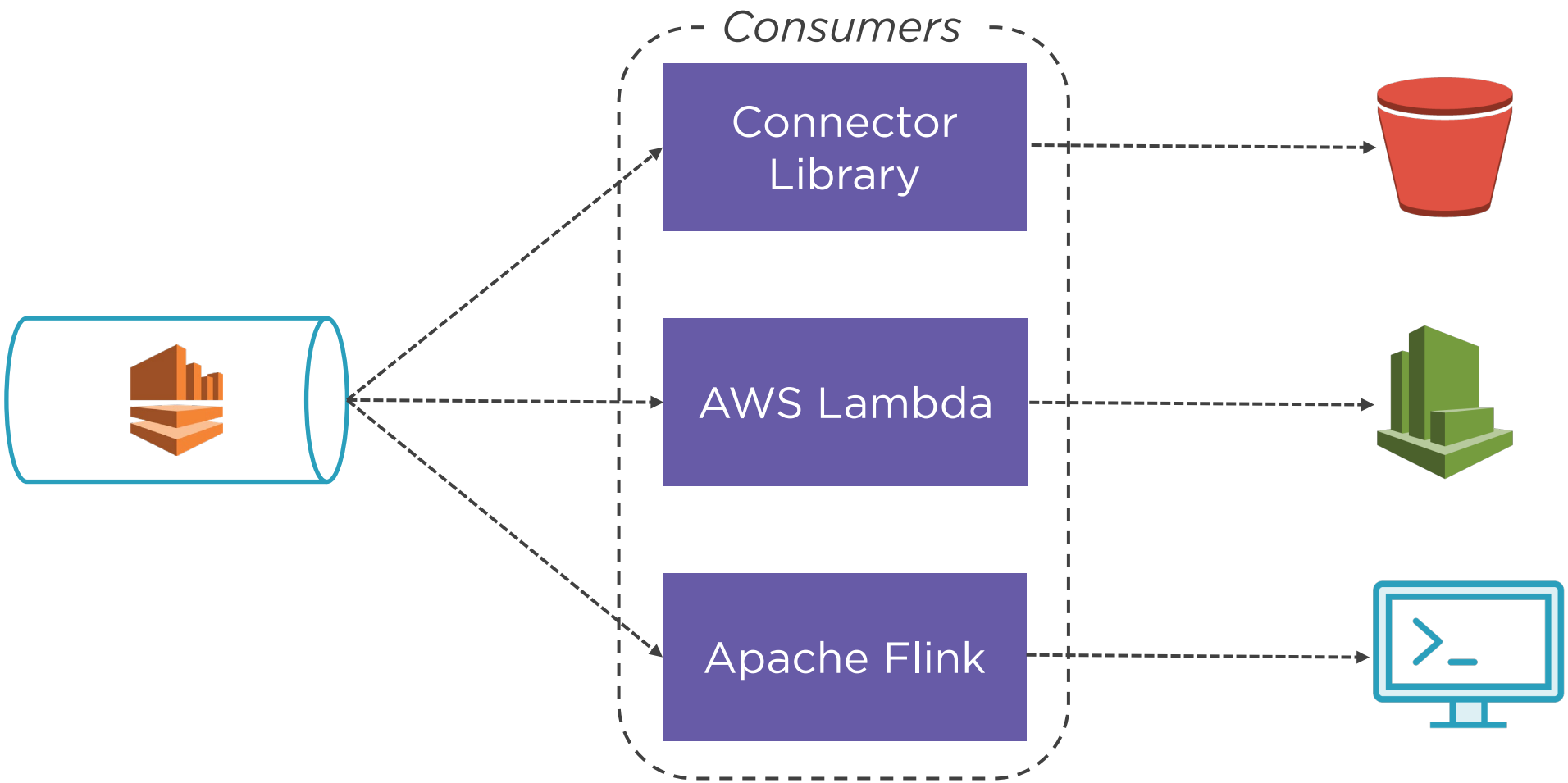
Serverless computing platform



4G Stream processing framework

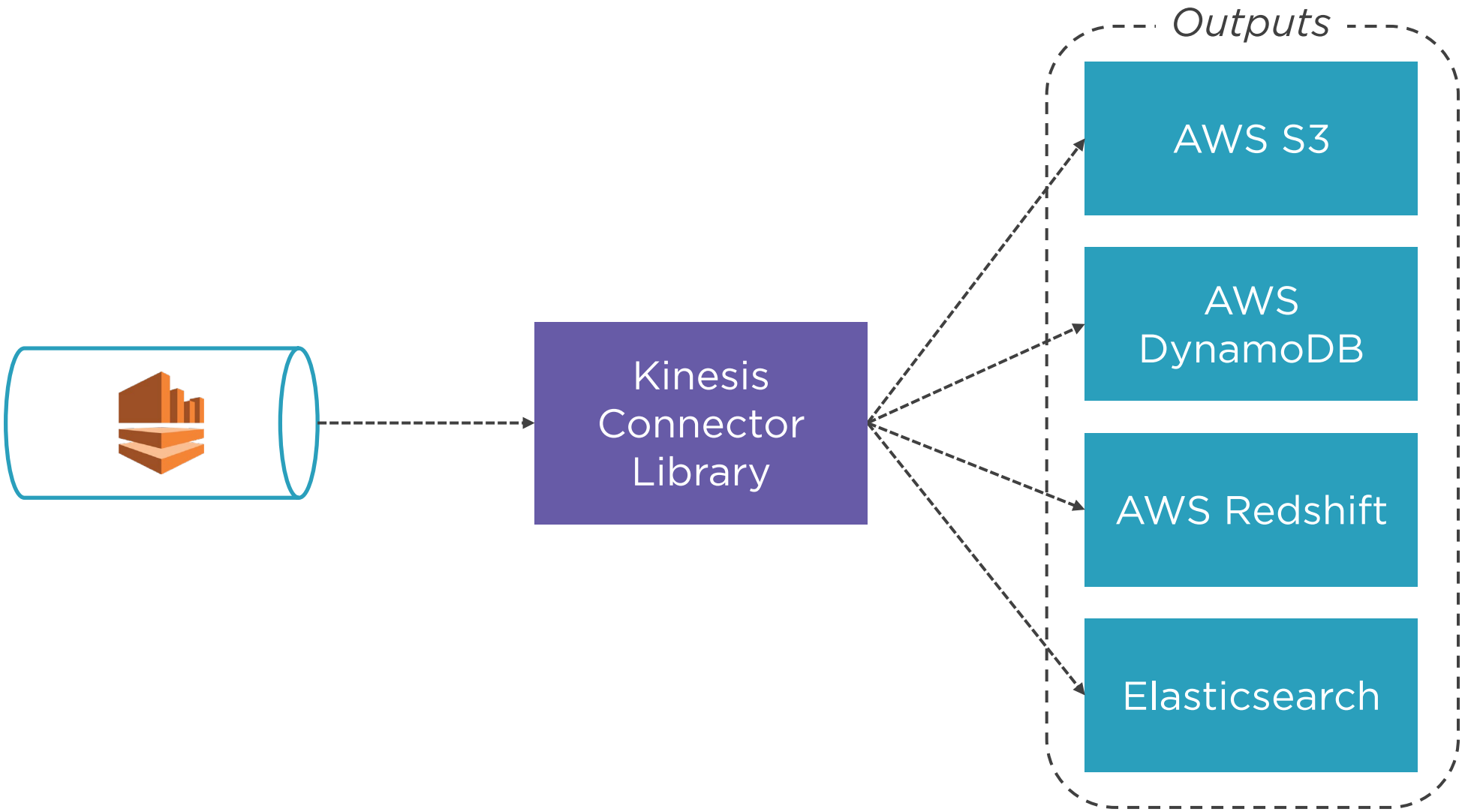
(similar to Apache Spark)

Overview

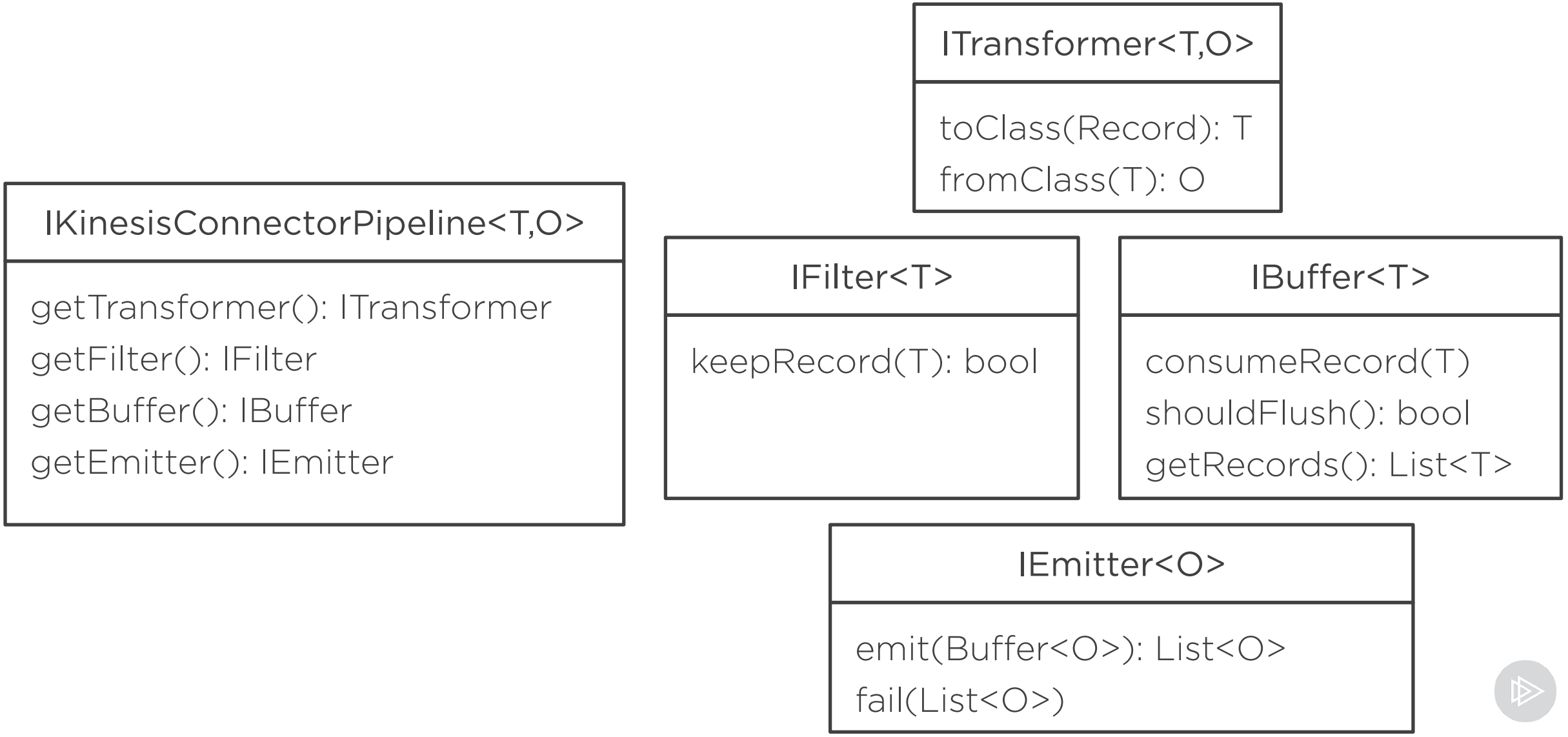


Saving Kinesis Data to S3

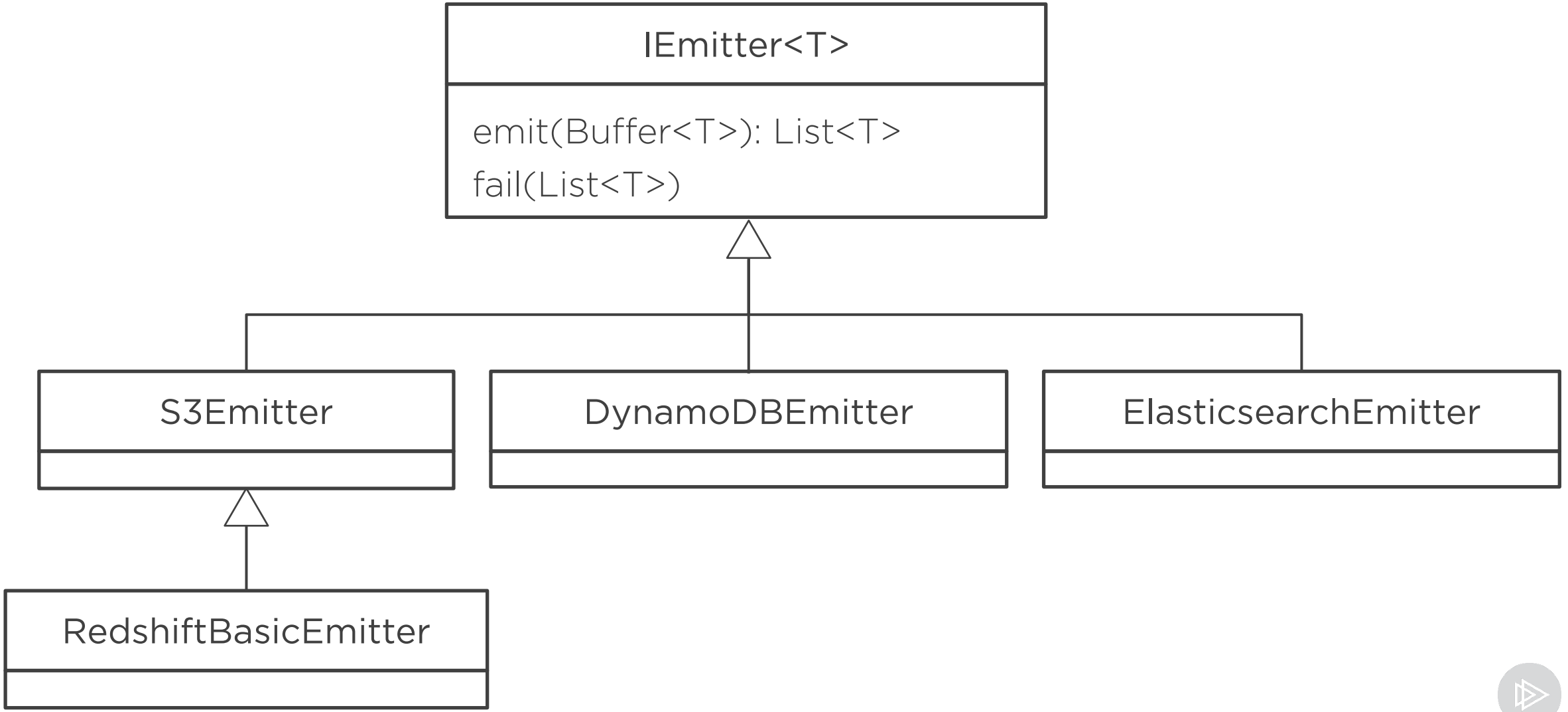
Kinesis Connector Library



Pipeline Stages



Emitters Implementations



Defining a Pipeline

```
public class Pipeline implements
    IKinesisConnectorPipeline<Status, byte[]> {

@Override
public ITransformer<Status, byte[]>
getTransformer(KinesisConnectorConfiguration c) {
    return new StatusTransformer();
}


@Override
public IFilter<Status> getFilter(KinesisConnectorConfiguration c) {
    return new AllPassFilter<KinesisMessageModel>();
}
```

Defining a Pipeline

```
@Override
public IBuffer<Status> getBuffer(KinesisConnectorConfiguration c) {
    return new BasicMemoryBuffer<>(c);
}

@Override
public IEmitter<byte[]> getEmitter(KinesisConnectorConfiguration c) {
    return new S3Emitter(c);
}

}
```

Configuration for Connector Library

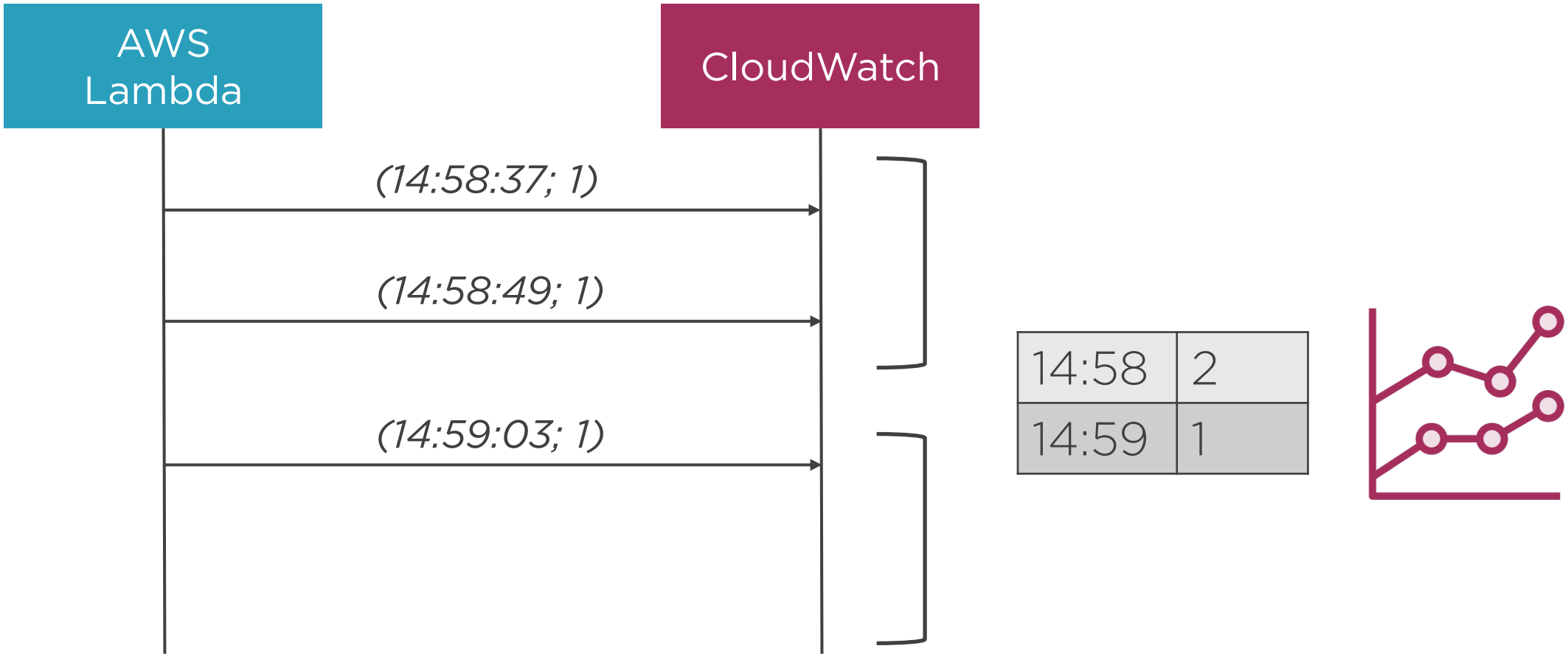
```
Properties properties = new Properties();

properties.setProperty(
    KinesisConnectorConfiguration.PROP_APP_NAME,
    "save-to-s3"
);

properties.setProperty(
    KinesisConnectorConfiguration.PROP_S3_BUCKET,
    "pluralsight-kinesis-course"
);

properties.setProperty(
    KinesisConnectorConfiguration.PROP_BUFFER_BYTE_SIZE_LIMIT,
    "100"
);
```

Launching a Pipeline

```
KinesisConnectorConfiguration config = new
KinesisConnectorConfiguration(
        properties,       // Configuration for Connector Library
        new DefaultAWSCredentialsProviderChain()
);

KinesisConnectorRecordProcessorFactory<Status, byte[]> factory =
        new KinesisConnectorRecordProcessorFactory<>(
                new Pipeline(),
                config
        );

// KCL worker
Worker worker = new Worker.Builder()
        .recordProcessorFactory(factory)
```

Plotting a Number of Tweets

Counting Tweets with CloudWatch



AWS Lambda

Serverless solution

Just need to upload code

Supports multiple programming languages

Integrated with Kinesis

Automatically scalable

Cost efficient

Reading Kinesis Data (JavaScript)

```
exports.handler = (event, context, callback) => {
  event.Records.forEach((record) => {
    var payload = new Buffer(record.kinesis.data, 'base64')
                      .toString('ascii');
    console.log('Decoded payload:', payload);
  }
};
```

Processing Aggregated Records

```
var agg = require('aws-kinesis-agg');

event.Records.forEach((record) => {
  agg.deaggregateSync(record.kinesis, true, (err, userRecords) => {
    userRecords.forEach((record) => {
      var tweetData = new Buffer(record.data, 'base64')
                          .toString('ascii');
    });
  });
});
```

What Are We Going to Implement?

Tweets

mushketyk 18:55

Working on my #AWS #Kinesis course

anonymous 18:57

For #Pluralsight?

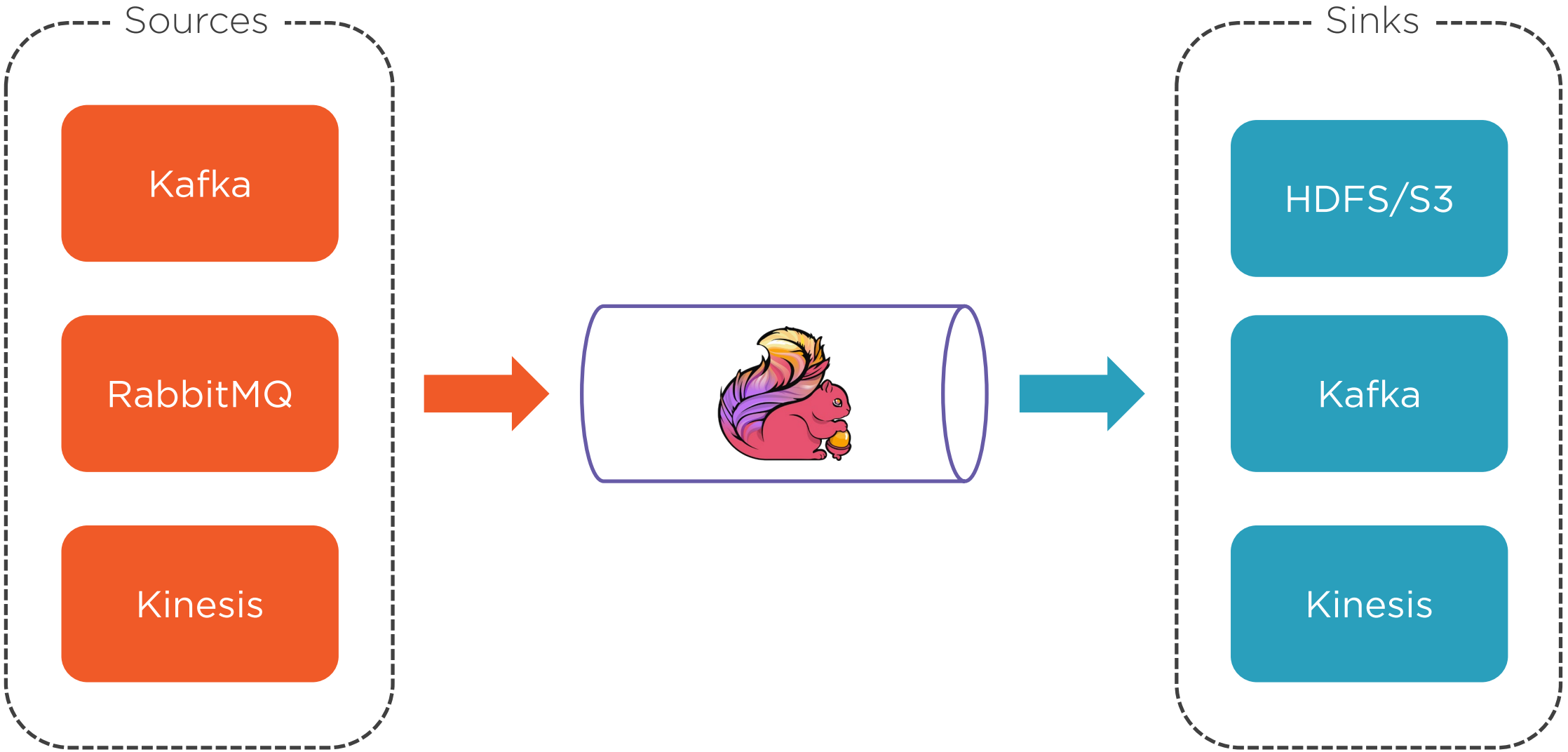
mushketyk 18:57

#Yep

hashtag	time	count
AWS	18:55	1
Kinesis	18:55	1
Pluralsight	18:57	1
Yep	18:57	1

Not a course about Apache Flink. To get more in-depth knowledge, please refer to “Understanding Apache Flink”

Apache Flink



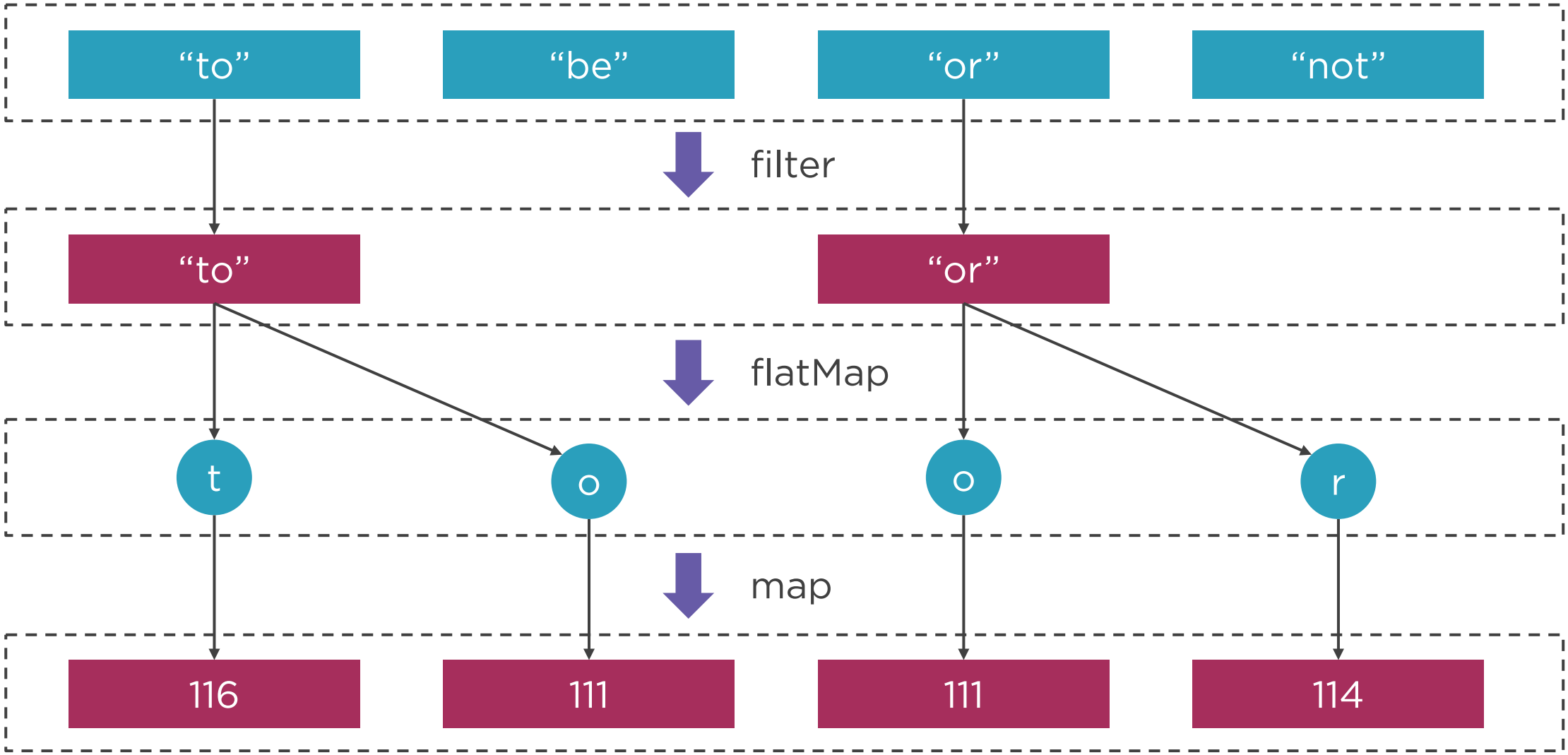
Why Apache Flink?

New 4G streaming framework

Low latency, high throughput

Developed ecosystem

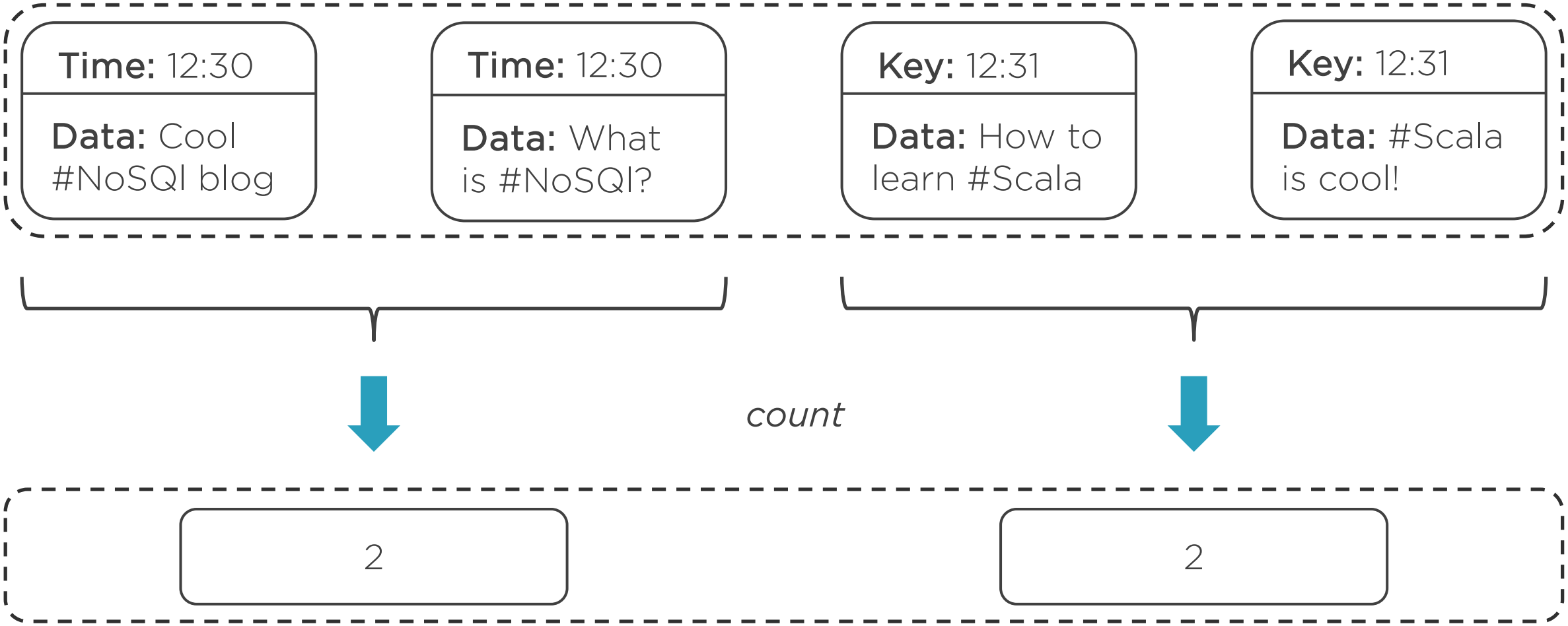
Stream Processing with Flink



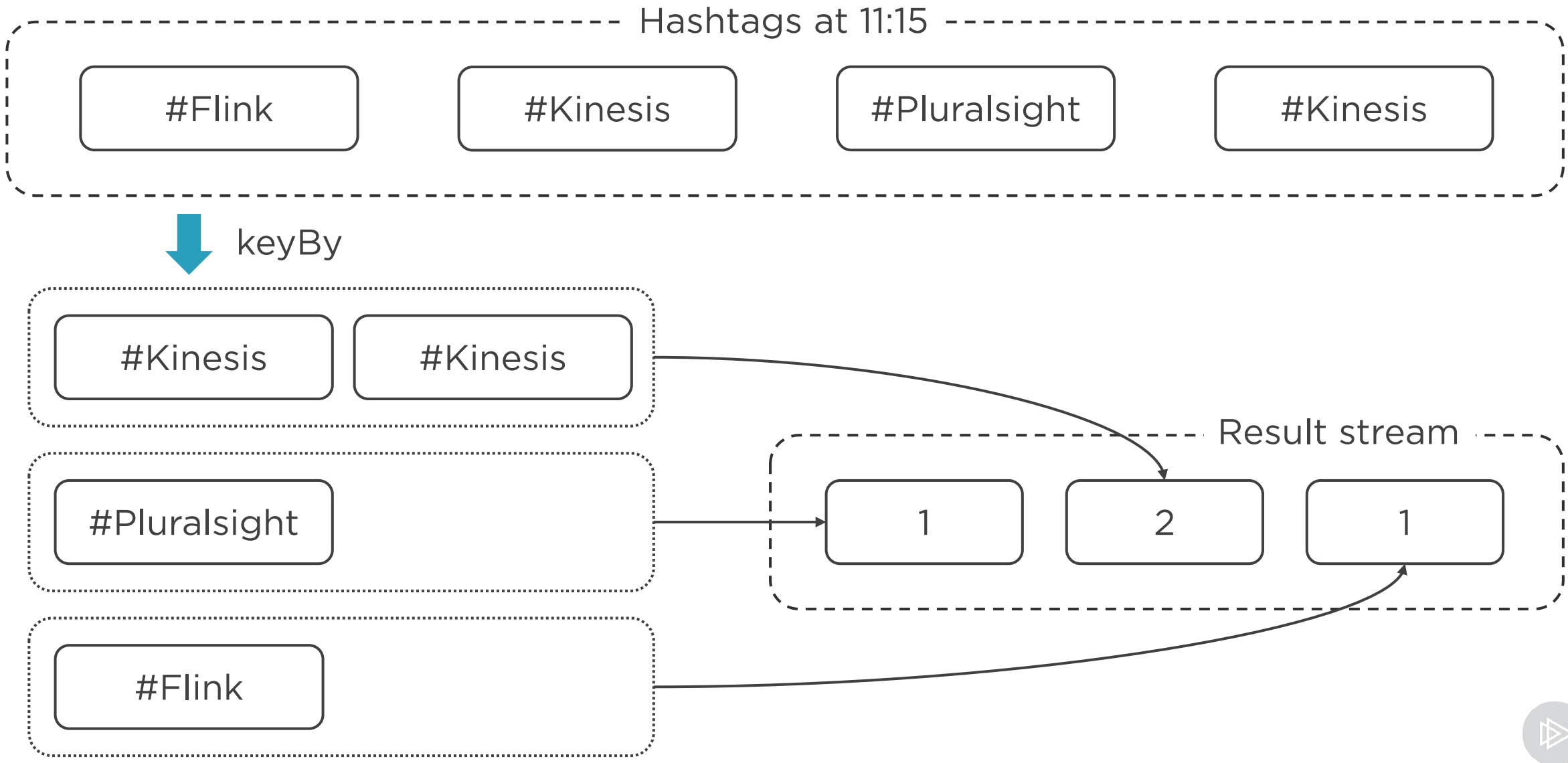
Process Stream Data

```
StreamExecutionEnvironment env =
StreamExecutionEnvironment.getExecutionEnvironment();

DataStream<Integer> stream = env.fromElements(4, 5, 6, 7, 8, 9);

stream.filter(new FilterFunction<Integer>() {
    @Override
    public boolean filter(Integer integer) throws Exception {
        return integer % 2 == 0;
    }
}); // returns DataStream with [4, 6, 8]
```

Processing Windows



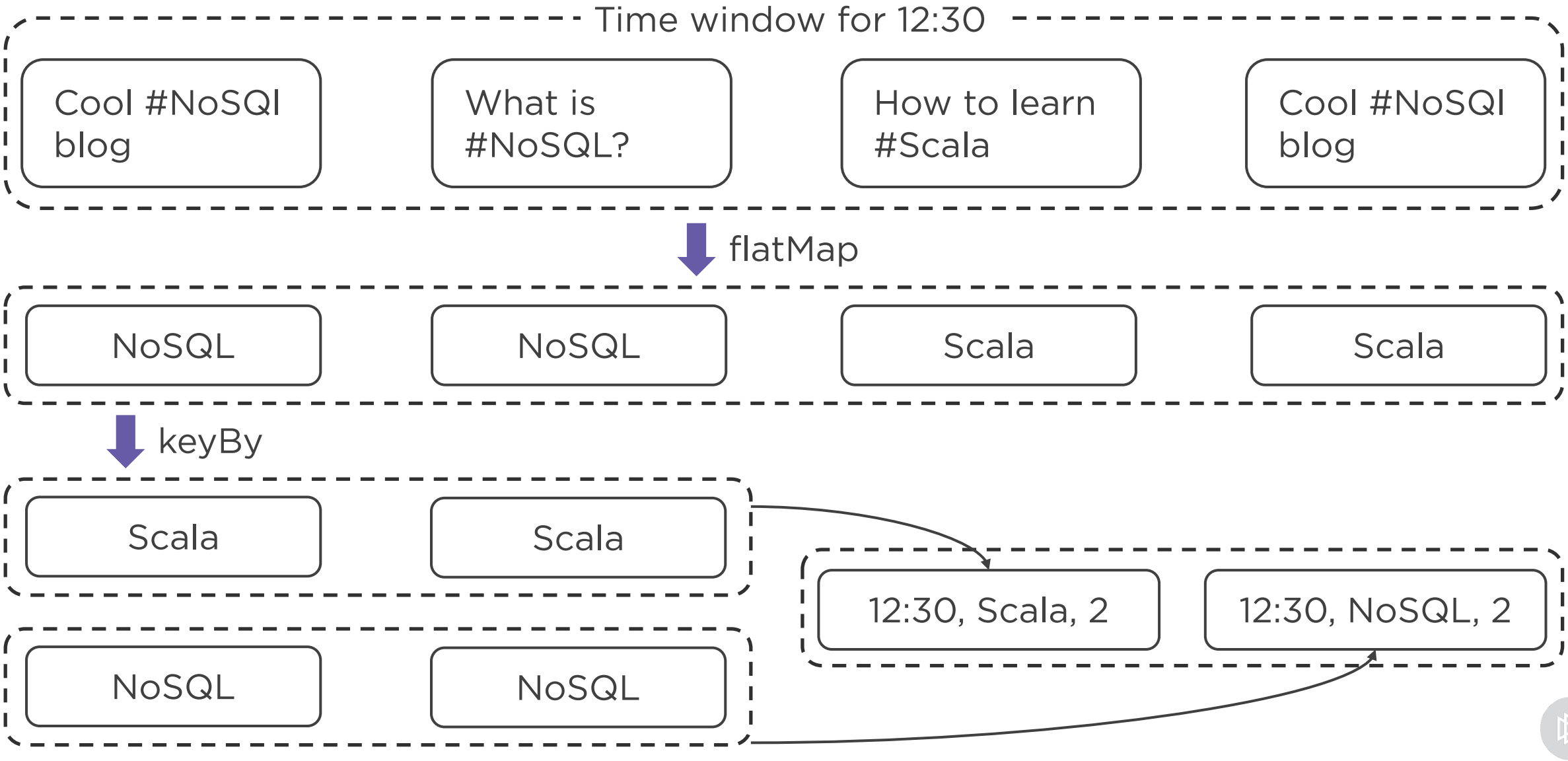
Keyed Windows



Create Keyed Window

```
DataStream<String> hashTagStream = ...
hashTagStream
   .keyBy(new KeySelector<String, String>() {
     @Override
     public String getKey(String hashTag) throws Exception {
         return hashTag;
     }
   })
   .timeWindow(Time.minutes(1))
   .apply(...);
```

Hashtag-counting Pipeline



Reading Data from Kinesis

```
Properties consumerConfig = new Properties();

consumerConfig.put(ConsumerConfigConstants.AWS_REGION,
                   "us-east-1");

consumerConfig.put(ConsumerConfigConstants.AWS_ACCESS_KEY_ID,
                   "...");

consumerConfig.put(ConsumerConfigConstants.AWS_SECRET_ACCESS_KEY,
                   "...");

consumerConfig.put(ConsumerConfigConstants.STREAM_INITIAL_POSITION,
                   "TRIM_HORIZON");
```

Reading Data from Kinesis

```
StreamExecutionEnvironment env =
StreamExecutionEnvironment.getExecutionEnvironment();

// Create Kinesis stream
DataStream<Record> kinesis = env.addSource(
        new FlinkKinesisConsumer<>(
                "tweets-stream",
                new RecordKinesisDeserializationSchema(),
                consumerConfig)
);
```

Summary