Big Data Engineer Bootcamp

Code 4

Agenda

Dev Environment

Work with Spark

Work with Redis

Work with Node.js

Interview Tips

Github Link

- https://github.com/UncleBarney/big-data-bootcamp

Start Docker Environment (MacOS, *nix)

- Have a docker-machine vm called bigdata
- Start a Zookeeper Container

```
docker run -d -p 2181:2181 -p 2888:2888 -p 3888:3888 --name zookeeper confluent/zookeeper
```

- Start a Kafka Container

```
docker run -d -p 9092:9092 -e KAFKA_ADVERTISED_HOST_NAME=`docker-machine ip bigdata` -e
KAFKA_ADVERTISED_PORT=9092 --name kafka --link zookeeper:zookeeper confluent/kafka
```

  - If backtick is not working for you, use your virtual machine ip directly

- Start a Redis Container

Start Docker Environment (Windows)

- Have a docker-machine vm called bigdata
- Start a Zookeeper Container

    -
      ```
      docker run -d -p 2181:2181 -p 2888:2888 -p 3888:3888 --name zookeeper confluent/zookeeper
      ```
- Start a Kafka Container

    -
      ```
      docker run -d -p 9092:9092 -e KAFKA_ADVERTISED_HOST_NAME=`docker-machine ip bigdata` -e
      KAFKA_ADVERTISED_PORT=9092 --name kafka --link zookeeper:zookeeper confluent/kafka
      ```
    - If backtick is not working for you, use your virtual machine ip directly
- Start a Redis Container

Agenda

Dev Environment

Work with Spark

Work with Redis

Work with Node.js

Interview Tips

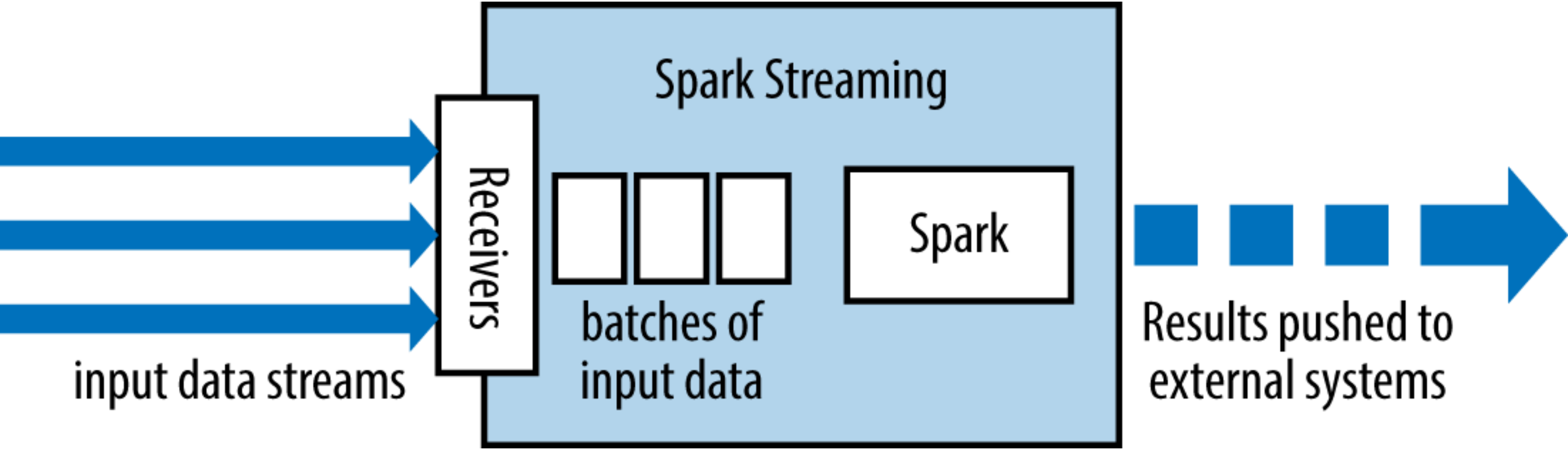
Functionality

- Stream data from Kafka
  - Should be able to read from any kafka cluster
  - Should be able to read from any kafka topic
- Perform Computation
  - Average every 5 seconds
- Write back to Kafka
  - Should be able to write to any kafka cluster

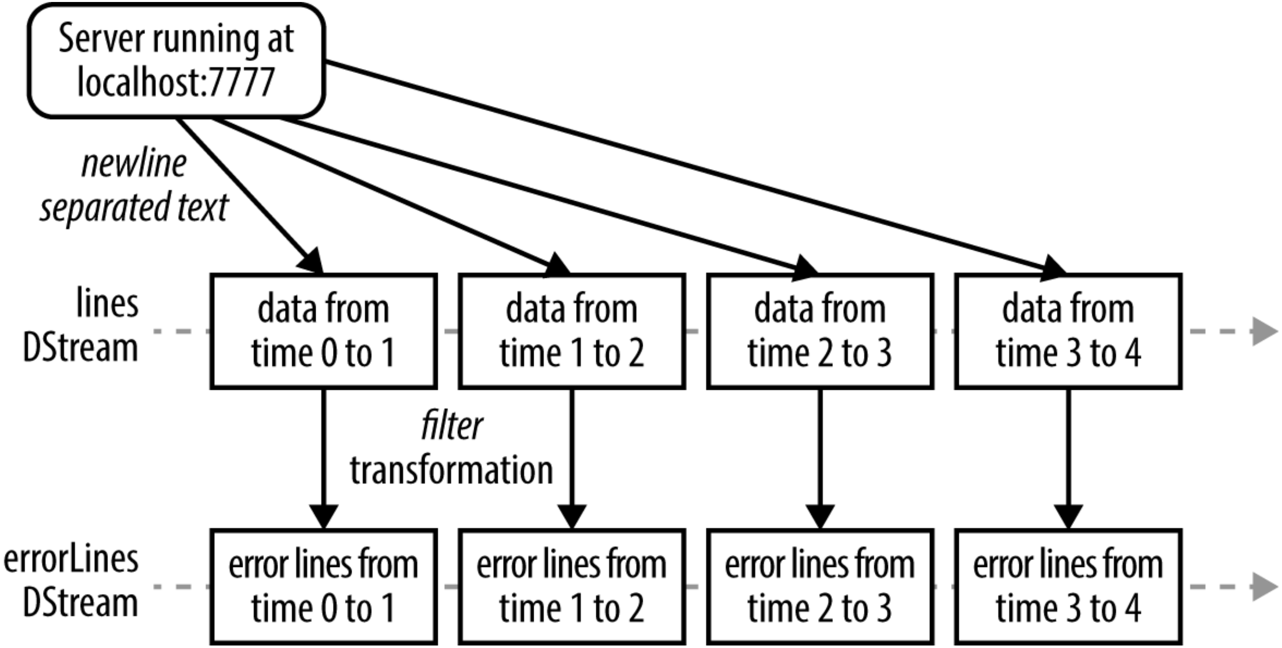
Work with Spark Using Python

- `pyspark`

Spark Streaming

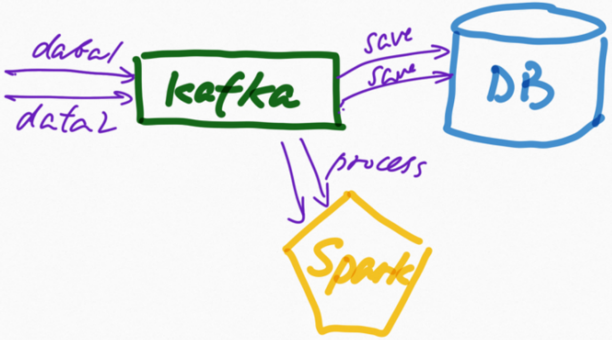


Spark Streaming



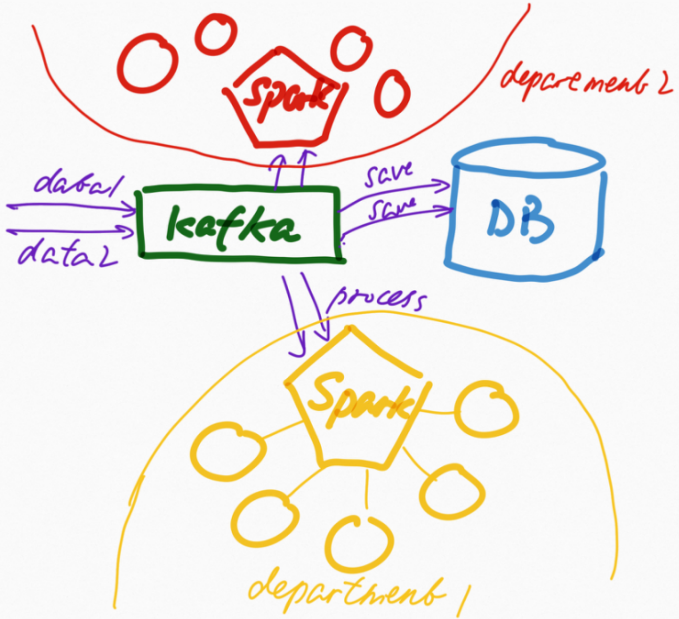
Where to Send Processed Data?

- Data is processed for consumption
  - Build Dashboard
  - Use as data model



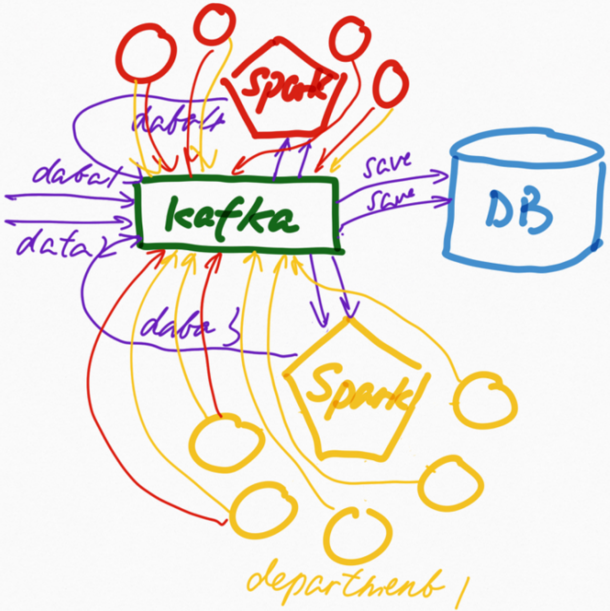
Where to Send Processed Data?

- Quickly create boundaries among teams
  - Data migration
  - Waste of resources



Send Data Back to Kafka

- No need to re-compute
- Encourage collaboration



Agenda

Dev Environment

Work with Spark

Work with Redis

Work with Node.js

Interview Tips

Functionality

- Read data from Kafka
  - Should be able to read from any kafka cluster
  - Should be able to read from any kafka topic
- Publish to a Redis Pub
  - Should be able to write to any Redis Server
  - Should be able to write to any Redis Pub

Work with Redis Using Python

- `pip install virtualenv`
- `virtualenv env`
- `pip install redis`
- `pip freeze > requirements.txt`

Agenda

Dev Environment

Work with Spark

Work with Redis

Work with Node.js

Interview Tips

Functionality

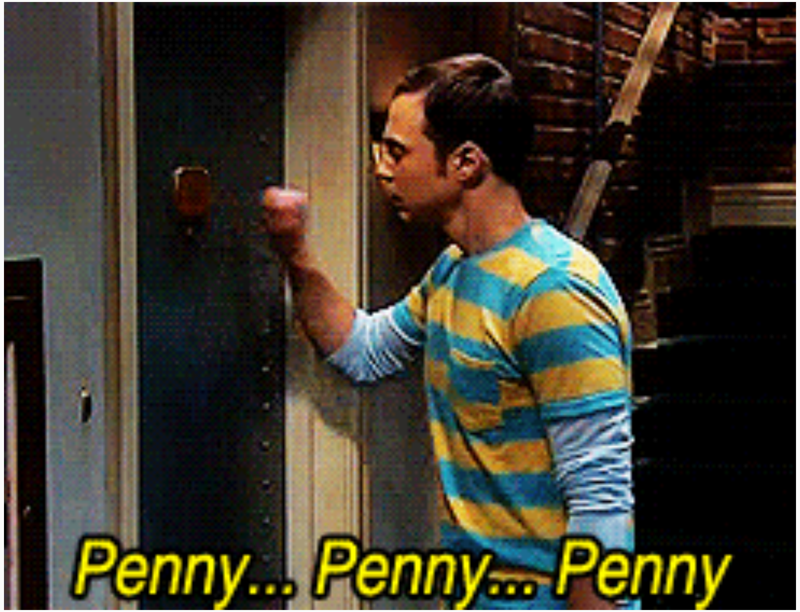
- Read data from Redis Sub
    - Should be able to read from any Redis Server
    - Should be able to read from any Redis Sub
- Update front-end UI as data come in
    - Socket.io
- Visualize data
    - smoothie.js, D3.js, Chart.js, Chartist.js …..

Work with Node.js

```
node -v

npm -v

npm install socket.io --save

npm install express --save

npm install minimist --save

npm install smoothie --save
```

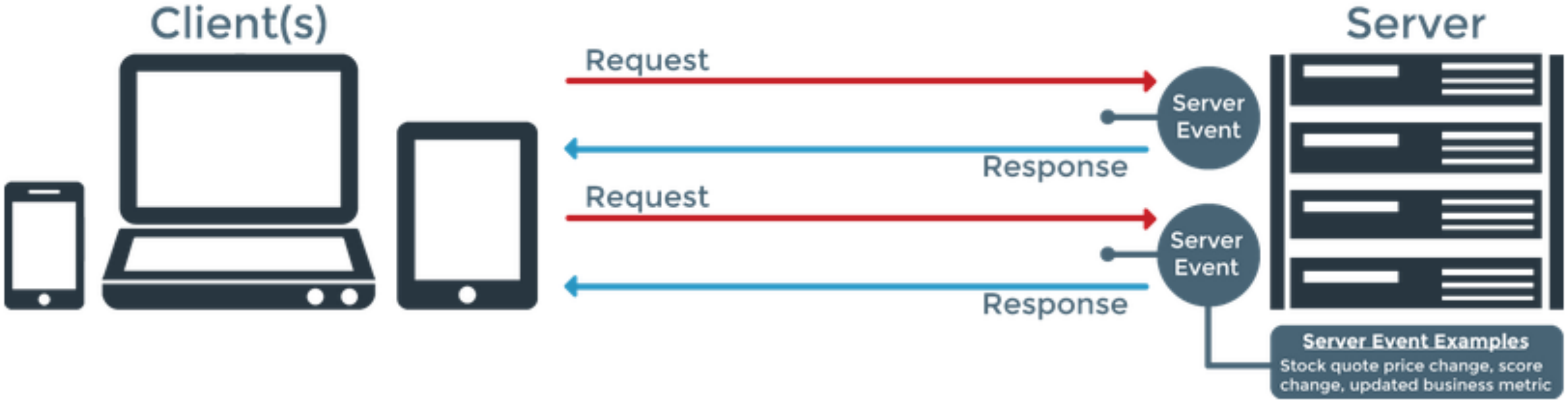
How to Get Real Time Update

- Poll at an interval



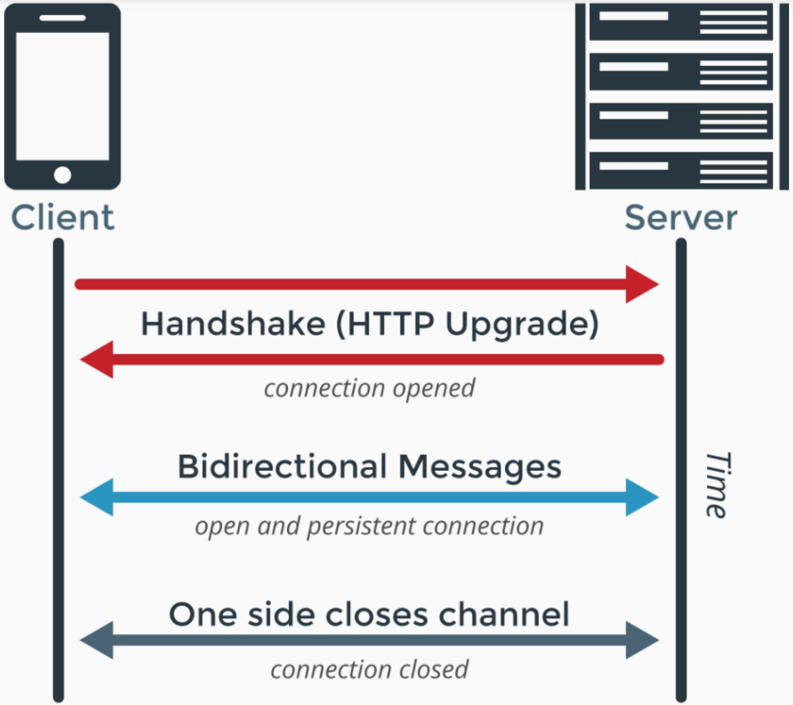
HTTP Requests and Response

- One request, one response



Websocket

- A long connection is established after initial handshake
- Server can ‘push’ data to client



Data Encoding and Schema

- We have been transferring JSON all over the place
  - Good cross-language parsing
  - Inefficient network IO
  - Other team cannot easily leverage your work
- Avro, Protocol Buffer, and Thrift to the rescue

Data Encoding and Schema

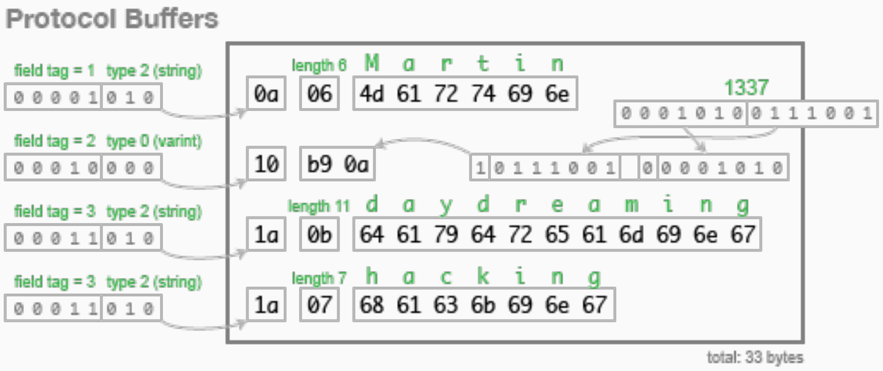
```
{
    "userName": "Martin",
    "favouriteNumber": 1337,
    "interests": ["daydreaming", "hacking"]
}
```

102 bytes

82 bytes without space and enter

Data Encoding and Schema

```
message Person {
    required string user_name       = 1;
    optional int64  favourite_number = 2;
    repeated string interests       = 3;
}
```



Further Reading

- Kafka Connect:
  - http://www.confluent.io/blog/announcing-kafka-connect-building-large-scale-low-latency-data-pipelines
- Redis Common Web Uses
  - http://highscalability.com/blog/2011/7/6/11-common-web-use-cases-solved-in-redis.html
- Apache Avro: https://avro.apache.org/
- Apache Thrift: https://thrift.apache.org/

Agenda

Dev Environment

Work with Spark

Work with Redis

Work with Node.js

Interview Tips

Interview Tips

Know Your Data

Use Numbers

Name Drop