# Fundamentals of Data Engineering

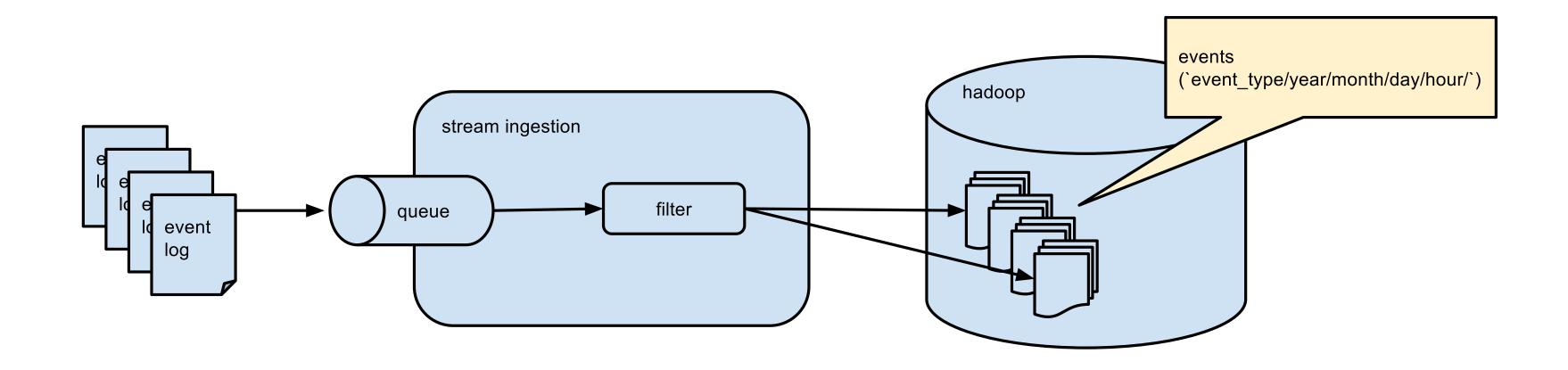
Week 09 - sync session

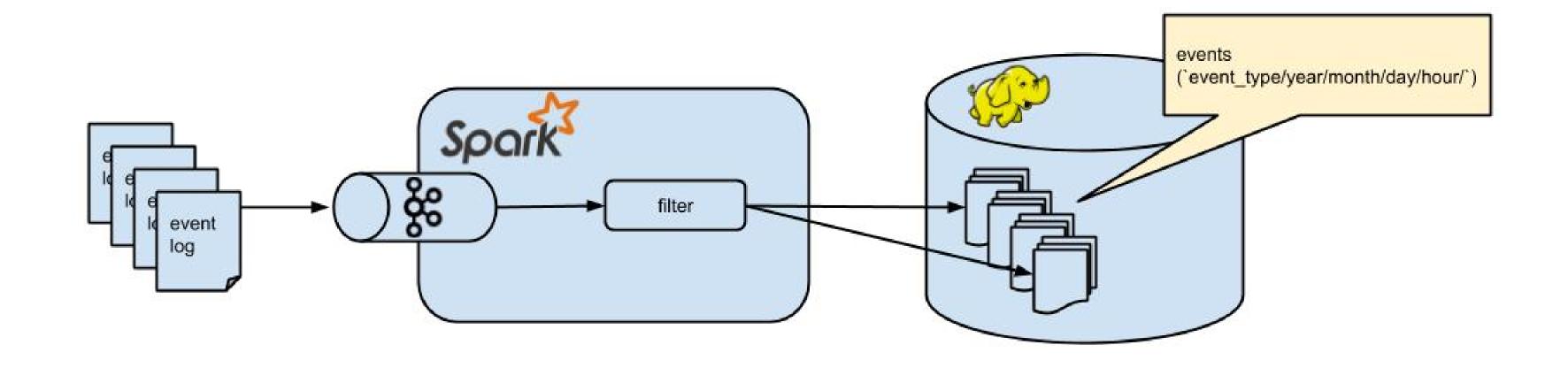
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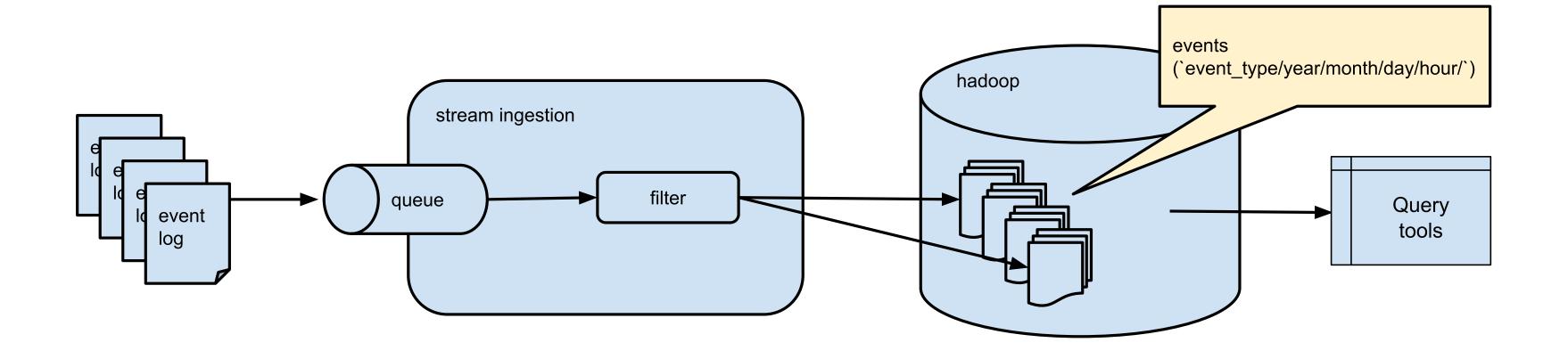
## Project Review

- Review your Project 2
- Get ready to share

## **Project Transition**









### Project 3 Setup

- You're a data scientist at a game development company.
- Your latest mobile game has two events you're interested in tracking:
- buy a sword & join guild...
- Each has metadata

## Project 3 Task

 Your task: instrument your API server to catch and analyze these two event types.

## Project 3 options

#### Flask with Kafka

#### Setup

Create a docker-compose.yml with the following

```
version: '2'
services:
  zookeeper:
    image: confluentinc/cp-zookeeper:latest
    environment:
      ZOOKEEPER_CLIENT_PORT: 32181
      ZOOKEEPER_TICK_TIME: 2000
    expose:
      - "2181"
      - "2888"
      - "32181"
      - "3888"
  kafka:
    image: confluentinc/cp-kafka:latest
    dananda on.
```

## Spin up the cluster

docker-compose up -d

## Create a topic events

```
docker-compose exec kafka \
   kafka-topics \
   --create \
   --topic events \
   --partitions 1 \
   --replication-factor 1 \
   --if-not-exists \
   --zookeeper zookeeper:32181
```

#### Should show

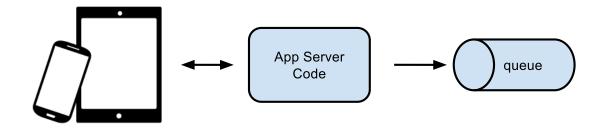
Created topic "events".

Let's create a web-based application

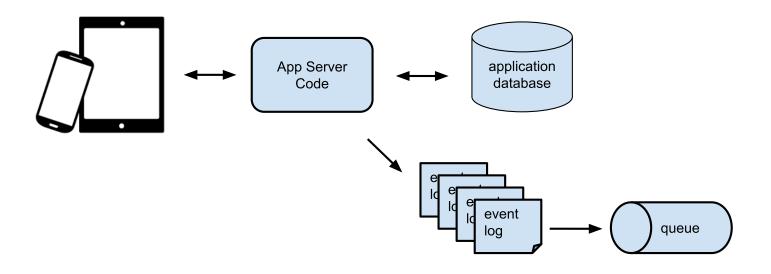
#### An example scenario

- You're a mobile game developer. During gameplay, your users perform various actions such as
- purchase a sword
- purchase a knife
- join a guild
- etc
- To process these actions, your mobile app makes API calls to a web-based API-server.





# No Load Balancing User Internet Web Server http://yourdomain.com/



#### An API server - usual case

User actions map to API endpoints

POST /purchase

## To keep it simple

Our actions will map to single API calls

GET /purchase\_a\_sword

#### Flask

 Use the python flask library to write our simple API server.

```
#!/usr/bin/env python
from flask import Flask
app = Flask(__name__)

@app.route("/")
def default_response():
    return "This is the default response!"

@app.route("/purchase_a_sword")
def purchase_sword():
    # business logic to purchase sword
    return "Sword Purchased!"
```

#### Save this as

~/w205/flask-with-kafka/basic\_game\_api.py and run it via

docker-compose exec mids env FLASK\_APP=/w205/flask-with-kafka/basic\_c

#### Test it out

docker-compose exec mids curl http://localhost:5000/

docker-compose exec mids curl http://localhost:5000/purchase\_a\_sword

## Stop flask

-Kill flask with ctrl-c.

Generate events from our webapp

Let's add kafka into the mix

```
#!/usr/bin/env python
from kafka import KafkaProducer
from flask import Flask
app = Flask(__name___)
event_logger = KafkaProducer(bootstrap_servers='kafka:29092')
events_topic = 'events'
@app.route("/")
def default_response():
    event_logger.send(events_topic, 'default'.encode())
    return "This is the default response!"
@app.route("/purchase_a_sword")
def purchase_sword():
    # business logic to purchase sword
    # log event to kafka
```

#### Run that

docker-compose exec mids env FLASK\_APP=/w205/flask-with-kafka/game\_ar

#### Test it out

Generate events

docker-compose exec mids curl http://localhost:5000/

docker-compose exec mids curl http://localhost:5000/purchase\_a\_sword

#### read from kafka

• Use kafkacat to consume events from the events topic

docker-compose exec mids bash -c "kafkacat -C -b kafka:29092 -t event

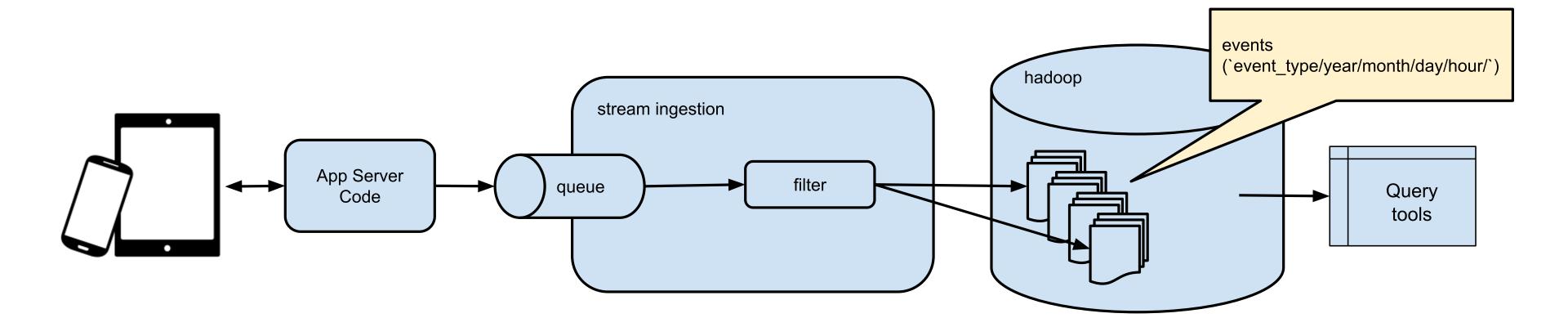
### down

docker-compose down

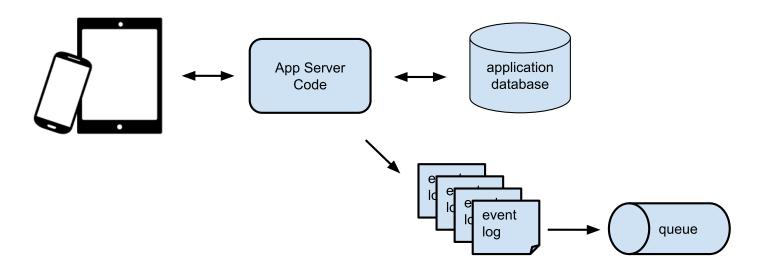
#### Week 9 Videos

- Basics of brokers, producers, consumers, topics
- Context for using Kafka in a pipeline in reality( aka, at scale, in production)

## Summary



## Summary



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