
the INTERNET
of EVERYWHERE
how The Weather Company scales
Robbie Strickland


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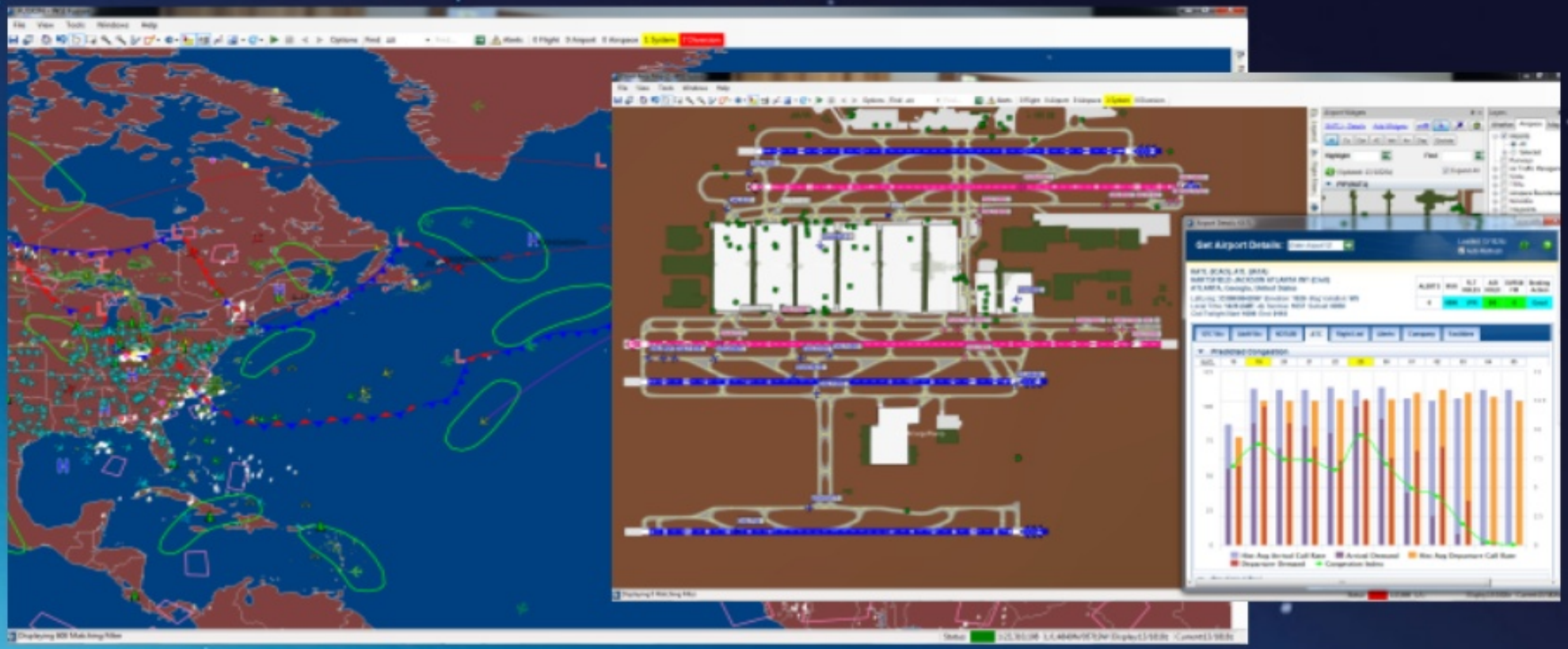
Everywhere Defined

- 26B forecasts /day or *250,000/second*
  - *vs 3.5B Google queries daily*
- 2.2 billion unique locations
- 200k personal weather stations
- 200M active mobile users
- Petabytes of data generated daily

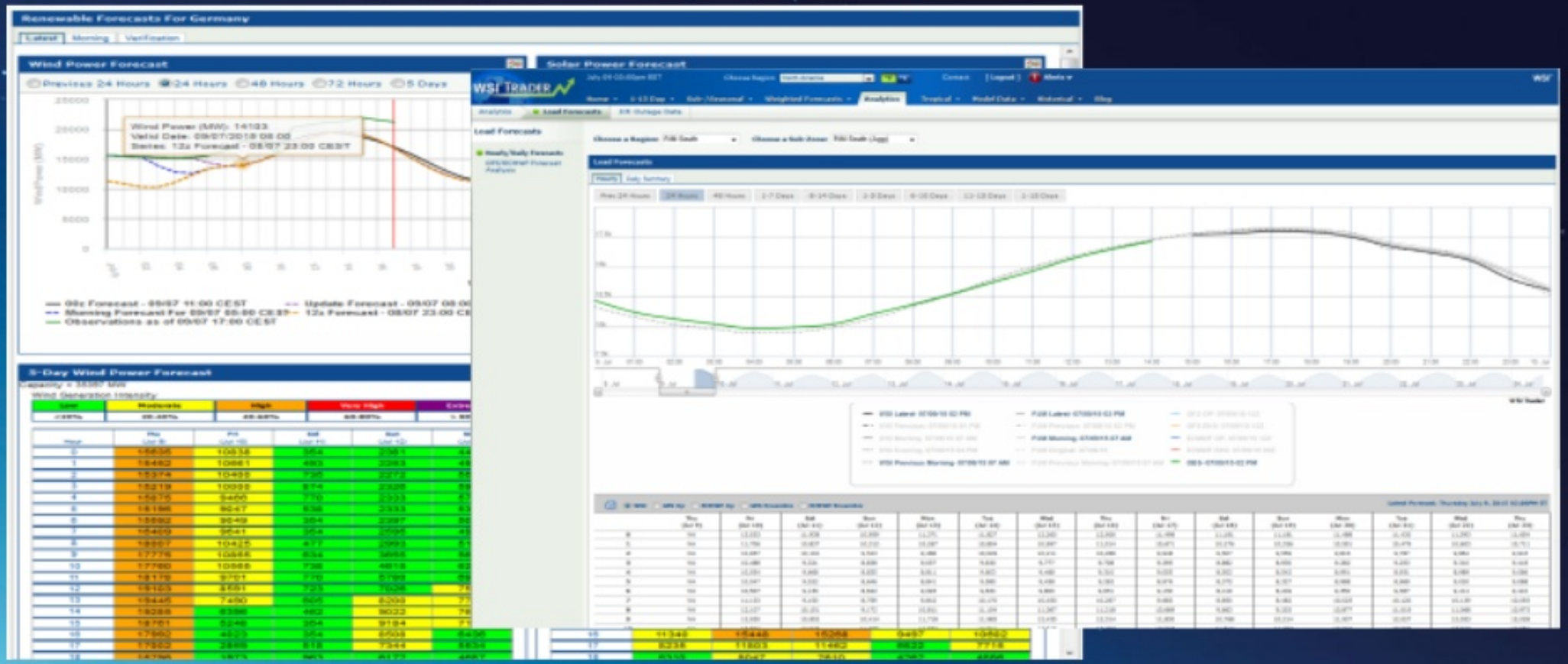
Our Brands


Over
30 Billion
Served

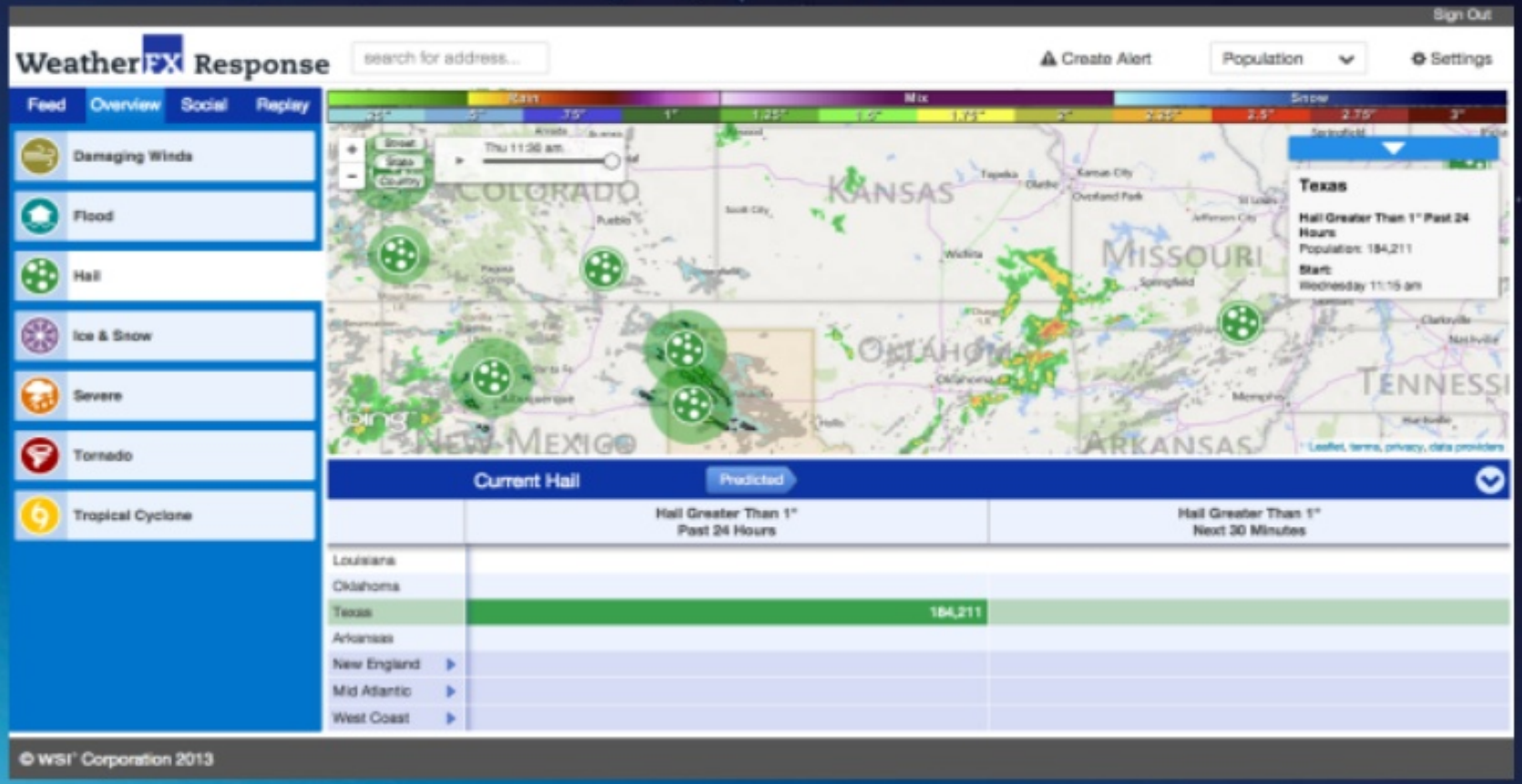
Flight Routing



Energy Trading



Insurance


Sign Out
WeatherFX Response
search for address...
Create Alert
Population
Settings
Feed
Overview
Social
Replay
Damaging Winds
Flood
Hail
Ice & Snow
Severe
Tornado
Tropical Cyclone
Rain
Mix
Snow
Thu 11:00 am
COLORADO
KANSAS
MISSOURI
OKLAHOMA
NEW MEXICO
ARKANSAS
TENNESSEE
Texas
Hail Greater Than 1" Past 24 Hours
Population: 184,211
Start:
Wednesday 11:15 am
Current Hail
Predicted
Hail Greater Than 1" Past 24 Hours
Hail Greater Than 1" Next 30 Minutes
Louisiana
Oklahoma
Texas
184,211
Arkansas
New England
Mid Atlantic
West Coast
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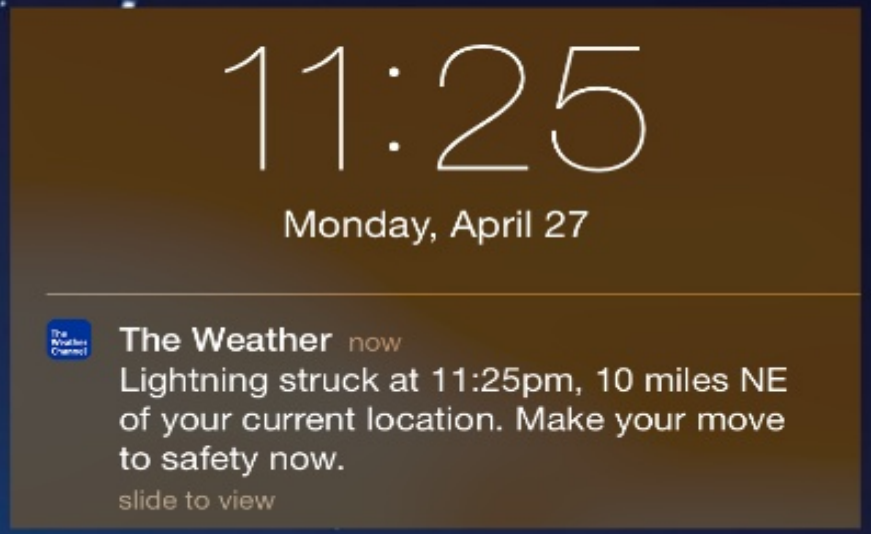
Weather Alerting



Decisions at Scale

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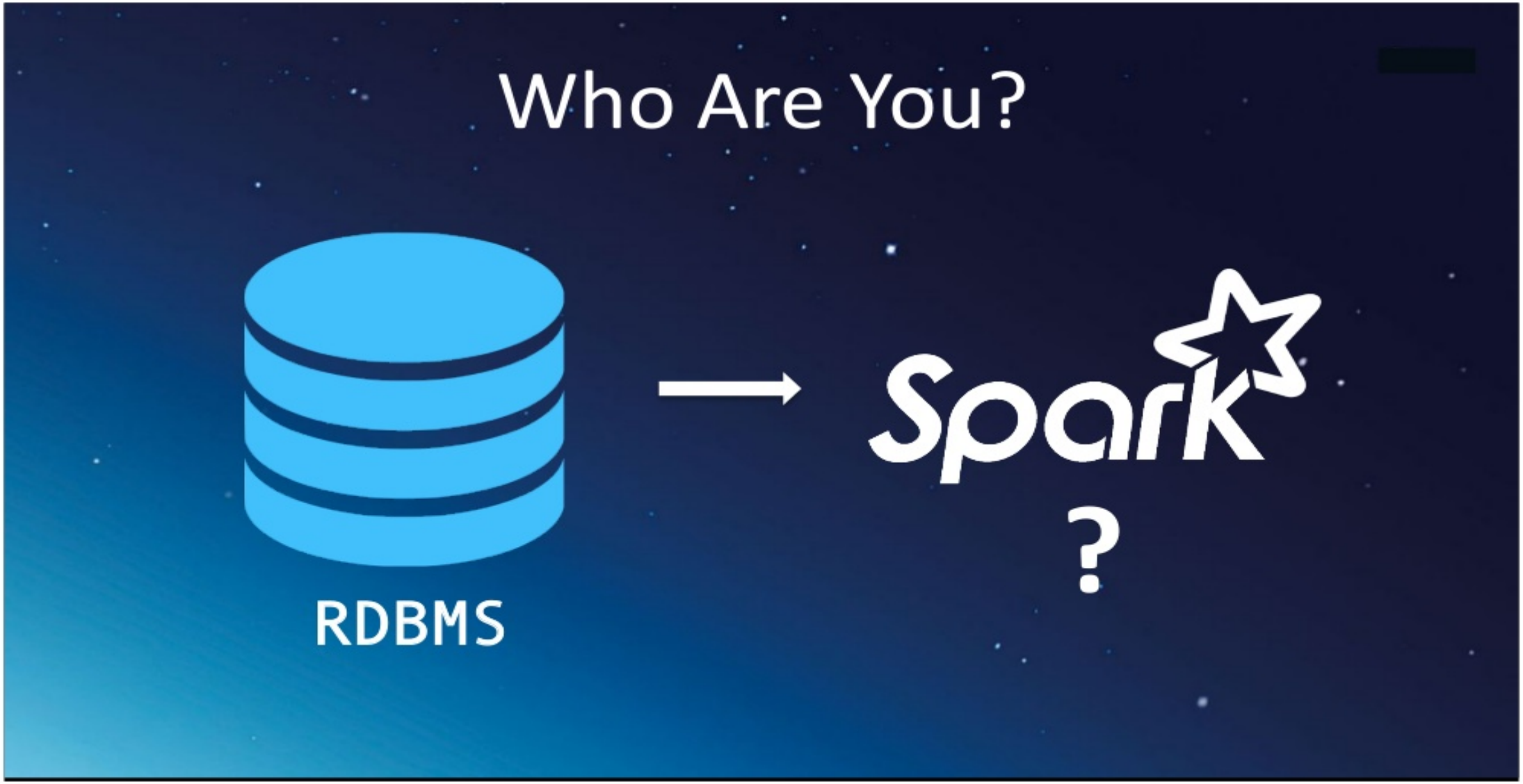
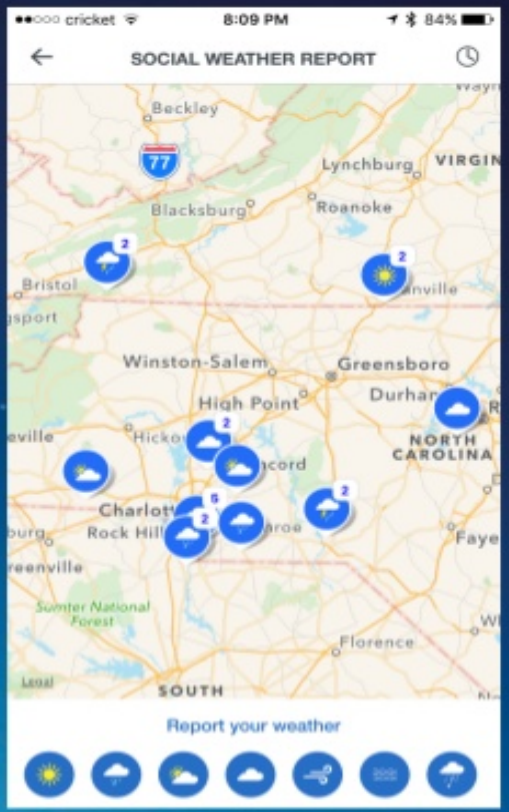
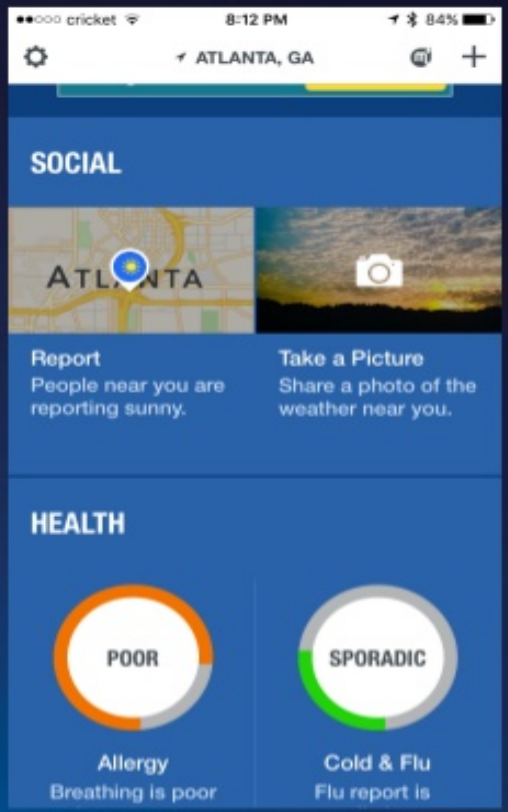

Who Are You?
RDBMS
Spark
?

Who Are You?

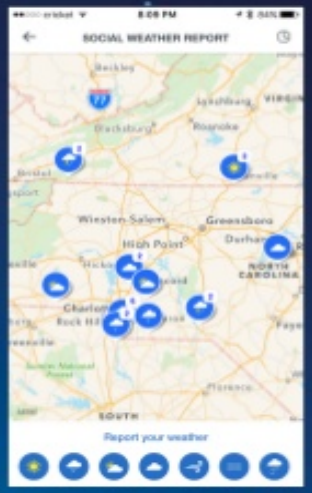
→ Spark ?

Social Weather

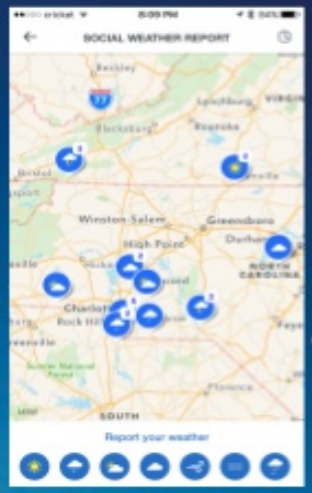




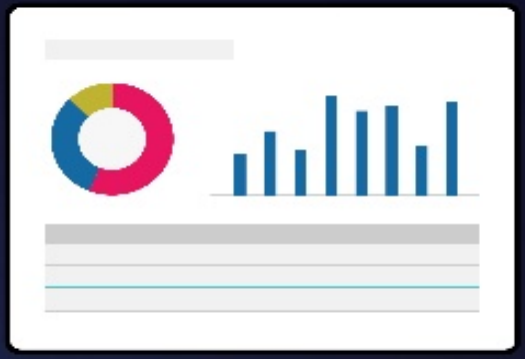
Social Weather



Social Weather

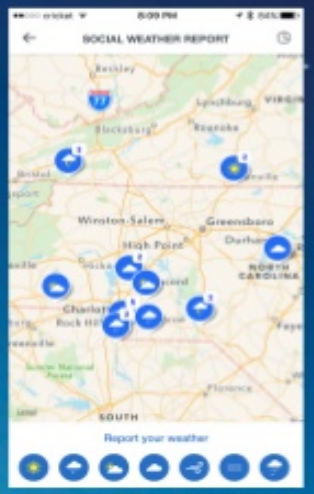


RDBMS



```
SELECT count(*) FROM wx_reports
GROUP BY time / 300000 * 300000
```

Social Weather

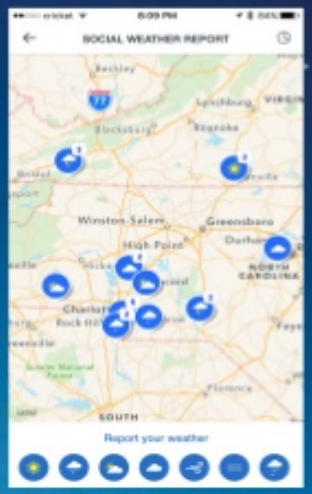


Live

ETL

Reporting

Social Weather



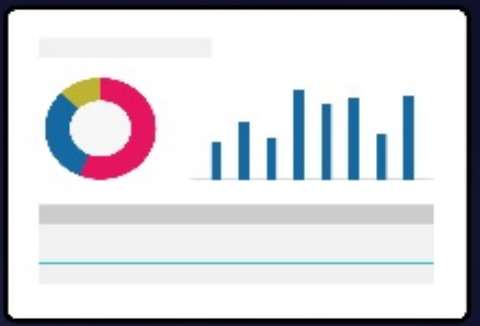
Live

Sqoop

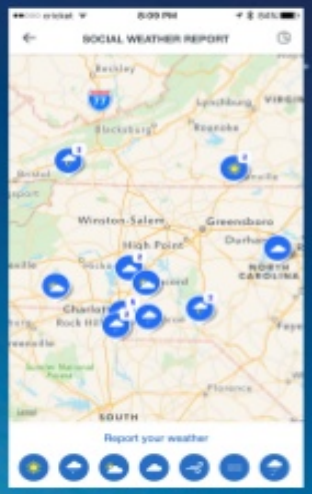
hadoop

M/R

Reporting

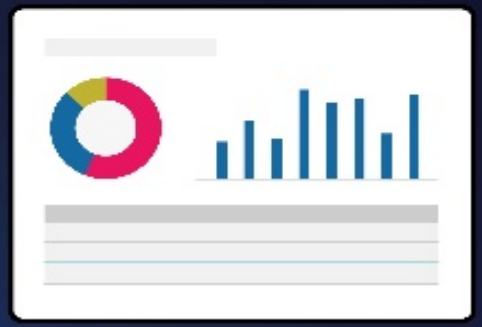


Scaling with Spark



Live

Reporting



Easing the Transition

1010011101001010100111010010101010010101101100110100101010111001000011010110010

Easing the Transition

101001110100101 →

101001110100101
010100101011001
101010101011100
000011010110010

Easing the Transition

1010011101001010100111010010101001010110011010101010111000000110101011010

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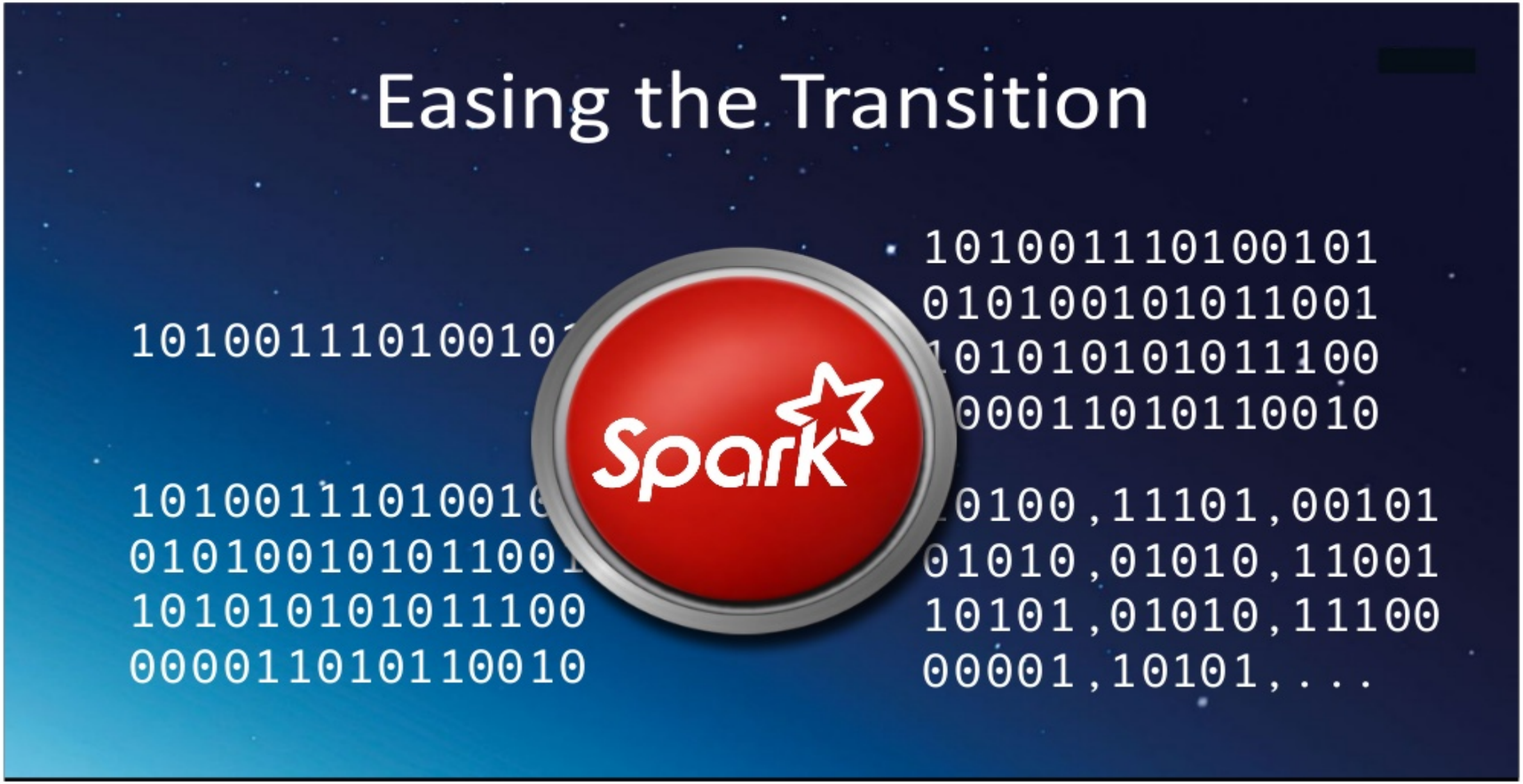
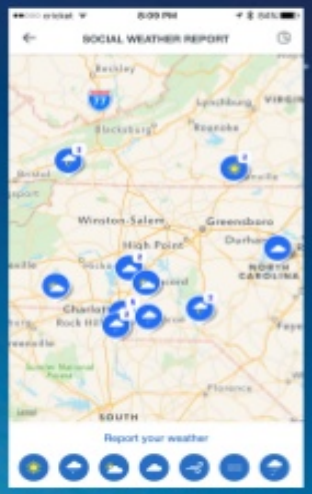
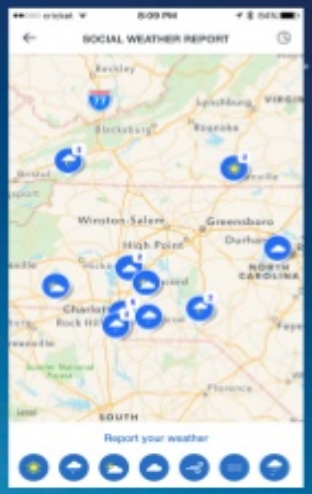
Easing the Transition



Scaling with Spark



Scaling with Spark



Spark

Live

Reporting

Batch Aggregation

```
val wx_reports = // load data from database

val sql = new org.apache.spark.sql.SQLContext(sc)
import sql.implicits._

wx_reports.toDF.registerTempTable("wx_reports")

val counts = sql("select count(*) from wx_reports group by
timestamp / 300000 * 300000")
```

Streaming Aggregation

```
val wx_reports = // load from streaming source

wx_reports.foreachRDD { rdd =>
  val sql = SQLContext.getOrCreate(rdd.sparkContext)
  import sql.implicits._
  rdd.toDF.registerTempTable("wx_reports")
  val count = sql("select count(*) from wx_reports")
}
```

Data Science Roles

Data Scientist

Data Engineer

Data Science Roles

Data Scientist

Machine learning expert

Data Engineer

Data Science Roles

Data Scientist

Machine learning expert

Data Engineer

Scalable algorithms expert

Data Science Roles

Data Scientist

Builds pipelines that work on her laptop

Data Engineer

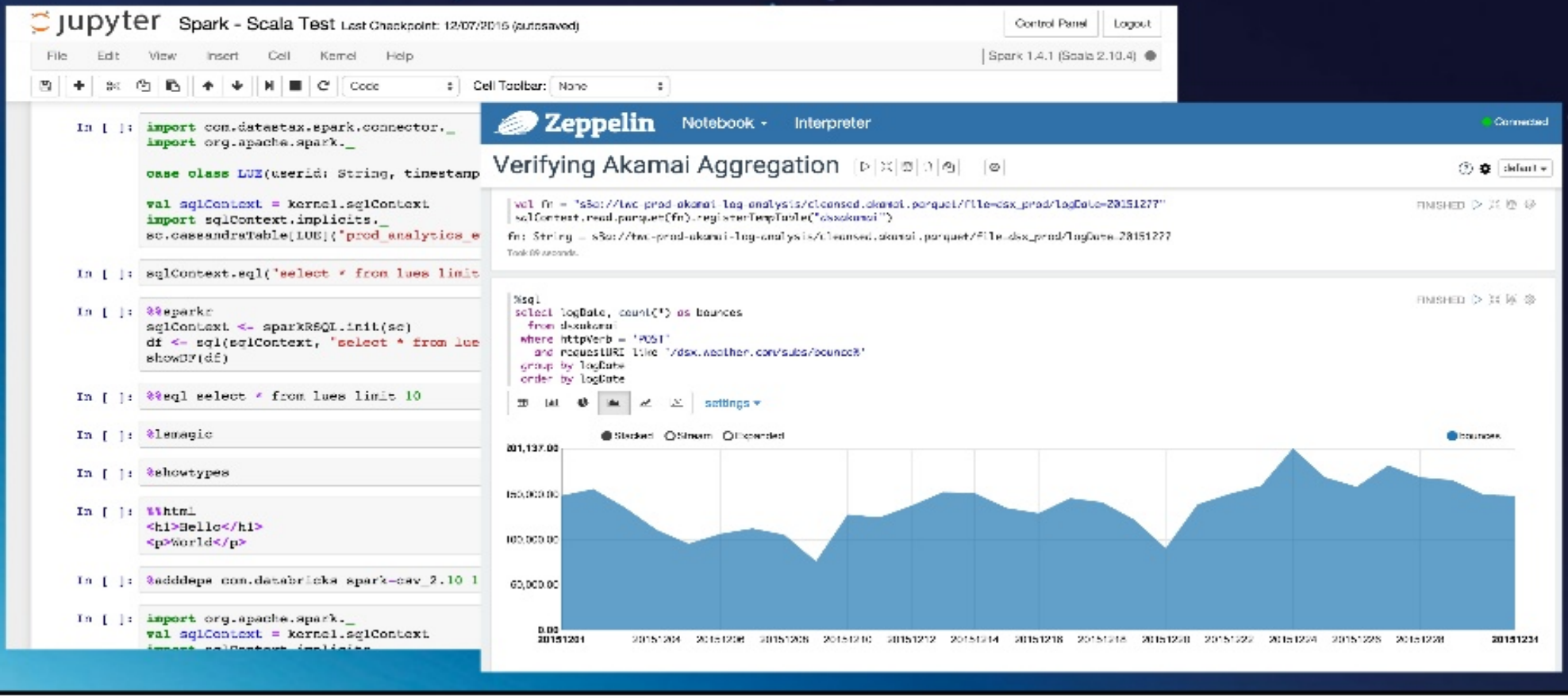
Data Science Roles

Data Scientist

Data Engineer

Rewrites her pipelines
to scale better

Collaborative Data Science



The Analytics OS

Notebooks

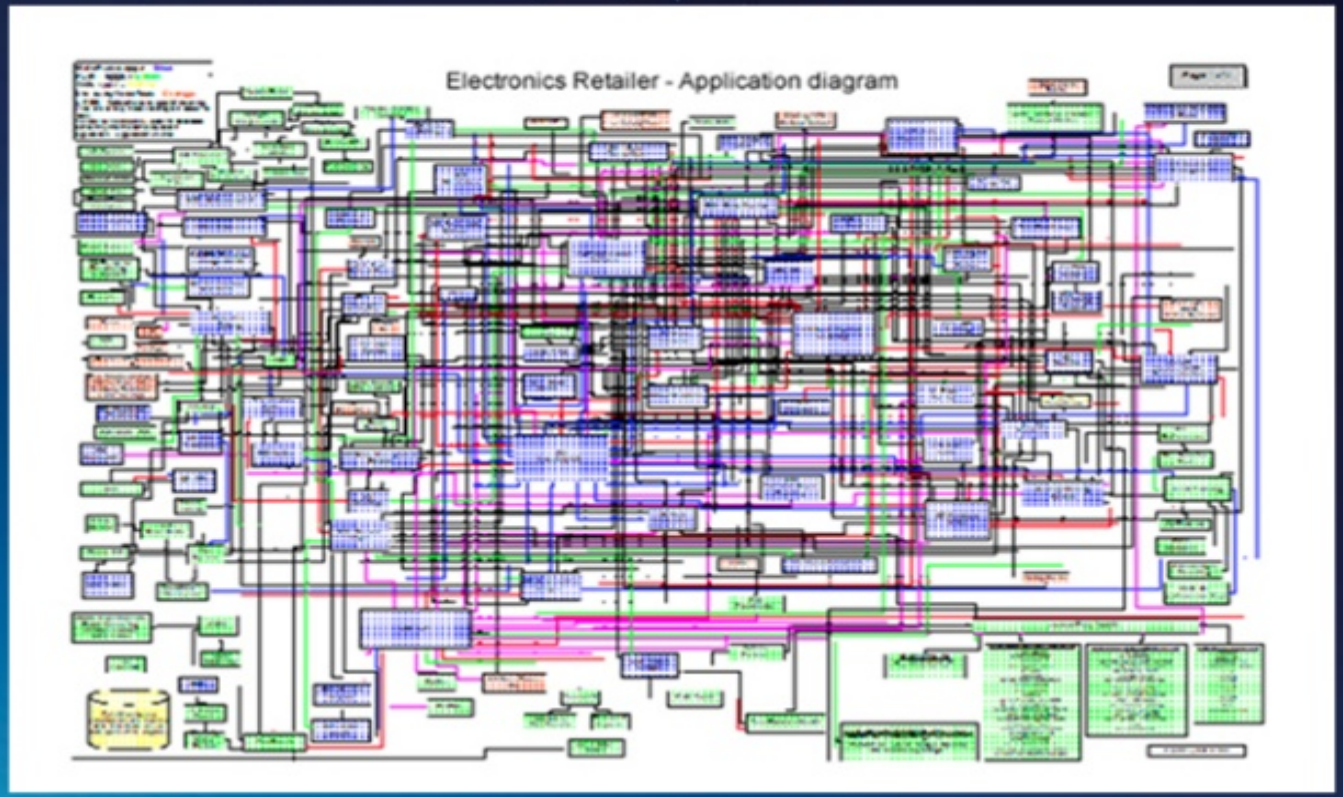
Stream Analytics

Batch Analytics

Spark


But …

The Real World (Enterprise Version)



The Real World (Startup Version)

Application

MySQL

Step 1: Pick a Problem to Solve

Step 2: Build a Data Lake

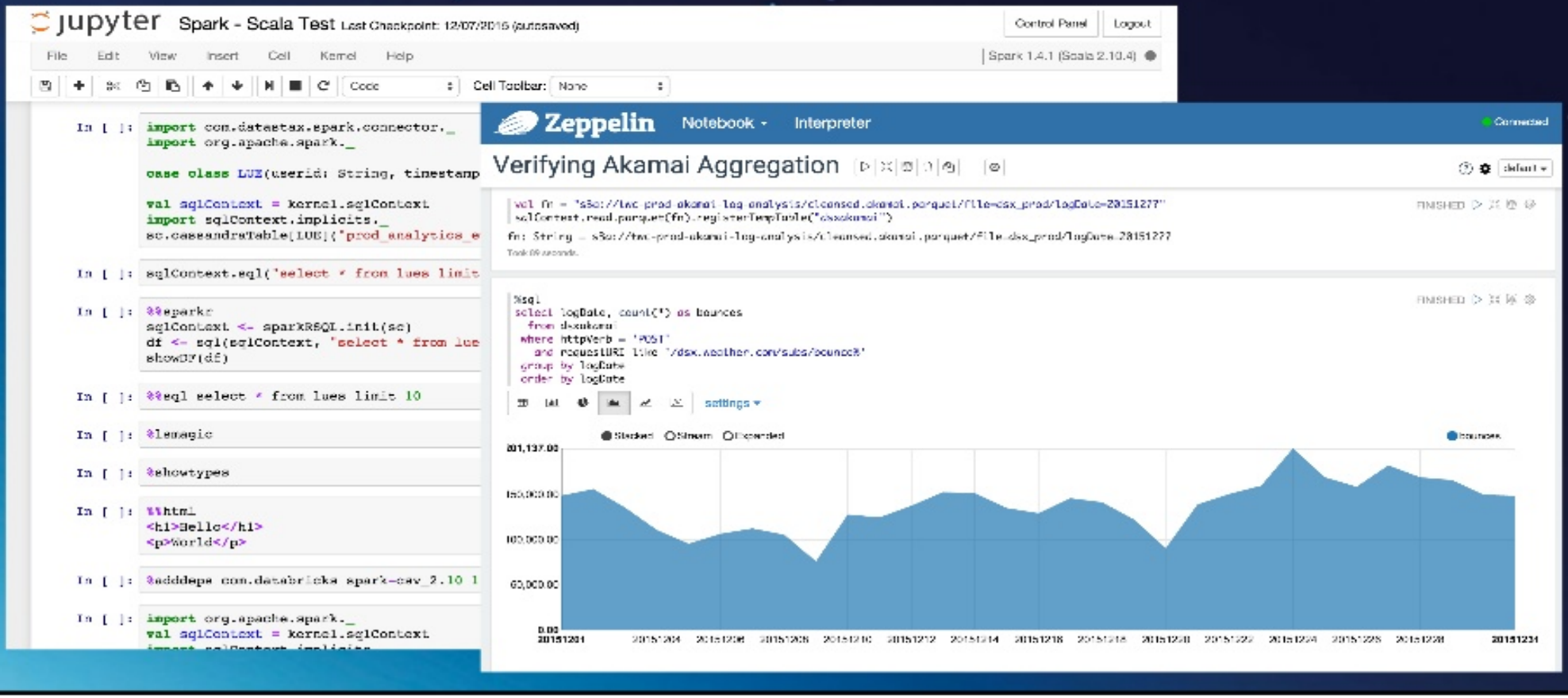
Step 3: Set up Spark

- Direct download
- Hadoop distribution (Hortonworks, Cloudera, etc)
- Managed service (Elastic MapReduce, Databricks, BlueMix, etc)

Step 4: Start Collecting Data

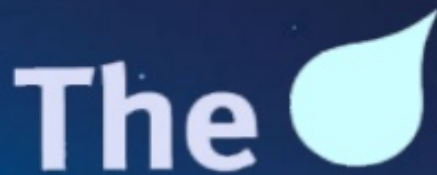
- Options:
  - Sqoop to move RDBMS tables
  - Flume/FluentD to move logs
  - Import from Spark-supported data sources
  - Using Spark Streaming attached to a queue
  - …

Step 5: Use a Notebook



Final Thoughts

Thank You!



Robbie Strickland
@rs_atl

(we're hiring!)