SILICON VALLEY

DATA SCIENCE

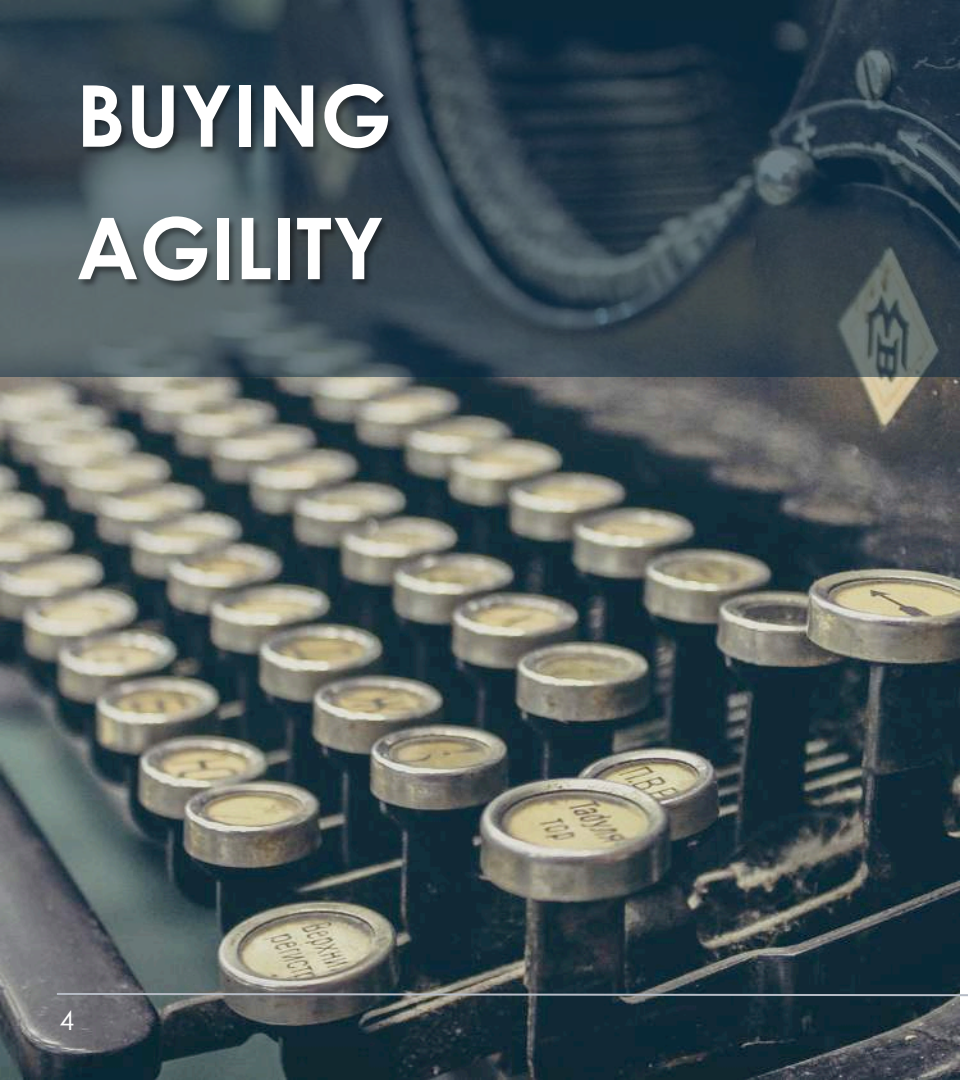
The Business Case For Spark, Kafka & Friends

Strata + Hadoop World NY 2015 • Edd Dumbill • @edd

SILICON VALLEY
DATA SCIENCE

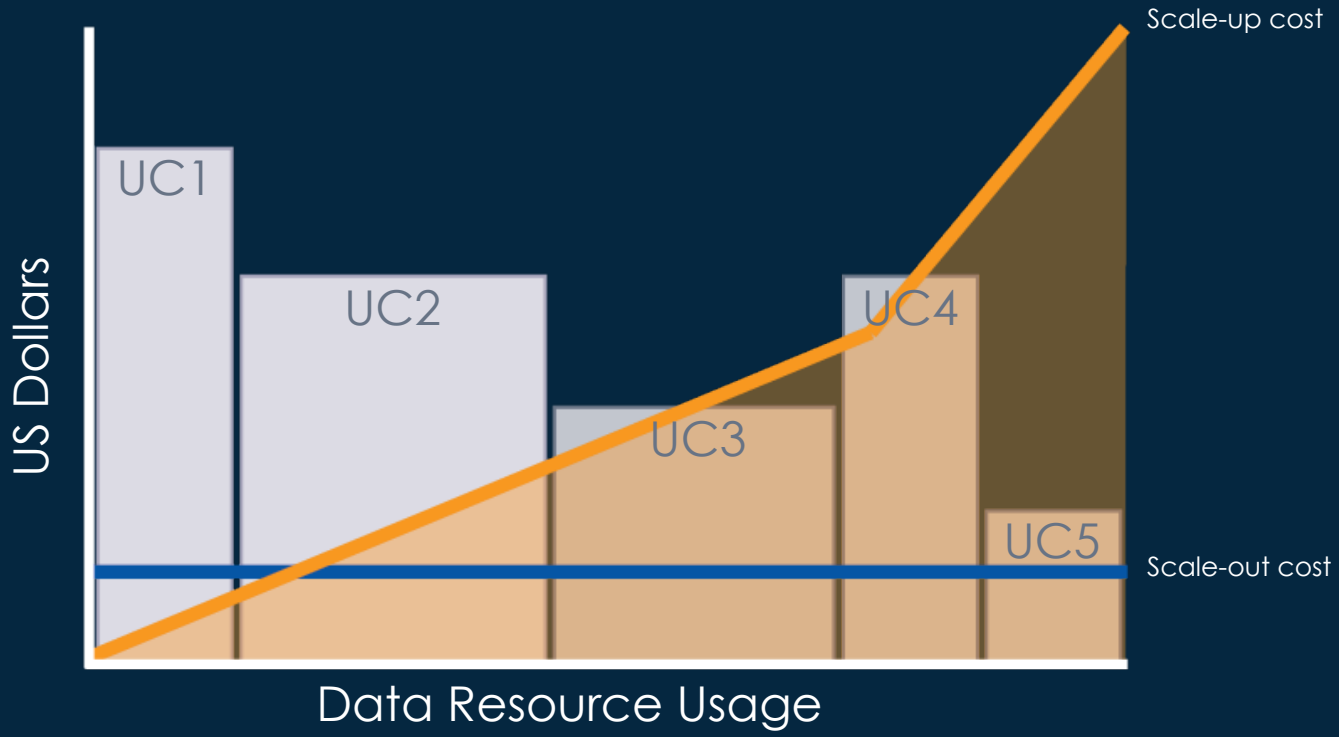

Big Data…
It's really about business agility

BUYING AGILITY



- Linear scale-out cost
- Opex vs capex
- Ease of purchase

UP vs OUT



Different use cases put different demands on the data infrastructure.

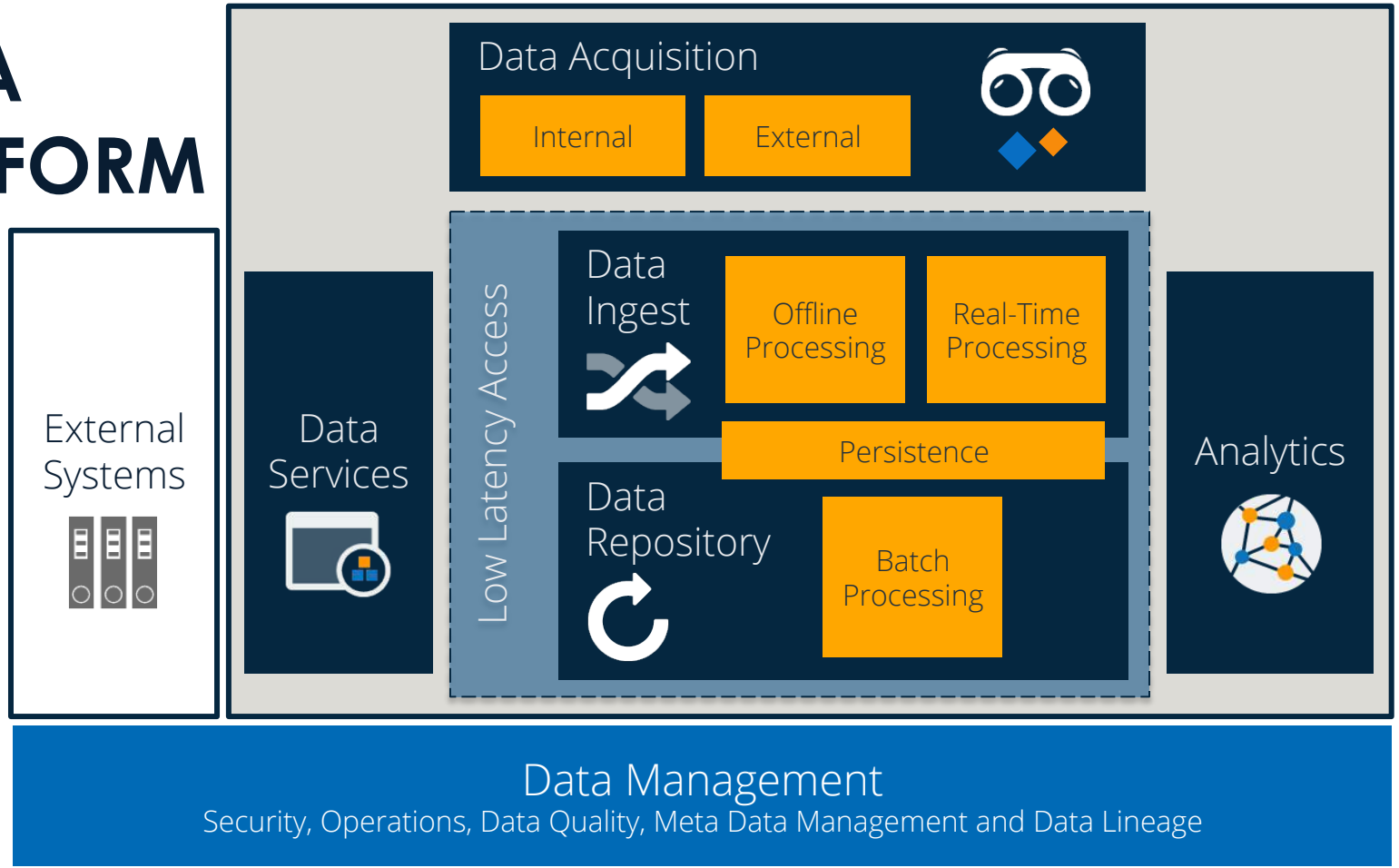
Increasing cost per unit of capability from scale-up architectures causes rationing of resources. Only the most valuable use cases are pursued.

Scale-out systems move us from managing scarcity to promoting utility

DEVELOPMENT AGILITY

- Architectural factors
  - Schema on read
  - Rapid deployment
  - Mirror production setup
  - Executes faster
- Programmer factors
  - Fun to program
  - Concision
  - Easier to test
  - Faster to write

DATA PLATFORM



What is Apache Spark?

- In-memory distributed computing platform
- Comes from Berkeley AMPlab
  - From the same stable: Mesos, Tachyon
- In production with early adopters
- Doesn't need Hadoop, but runs easily on top

Use cases

- Managing a major retailer's inventory across a diverse network of entities in near real time
- Managing and processing event streams for online gaming
- Supporting data science initiatives across massive data sets at a media analytics company

Why should business care?

- Spark enables use cases Hadoop didn't provide (streaming, interactive analytics, machine learning, graphs) all in one platform
- Spark is fast
  - Iteration time down, more productive
- Spark can use existing cluster investment
  - Sits on HDFS storage, can run under YARN (but also Amazon S3, or Cassandra)

Why should business care? (2)

- Spark speaks SQL
  - Use SQL skills and tools, e.g. Tableau
  - Spark Dataframes integrates external data sources into one context: RDBMS, Hive, JSON…
- Spark is developer-friendly
  - Concise and fluid to program
  - Language integration: Scala, R, Python, Java

What is Apache Kafka?

- Scale-out fault-tolerant messaging system
- Comes from LinkedIn
- Supported by Confluent

Use cases

- Stream processing
- Log aggregation
- Creating decoupled evented architectures

Why should business care?

- Kafka provides scalability in a critical area of distributed applications where it didn't exist before
- Kafka provides online reliability, compared to alternatives
- Will progress to be a core building block of distributed data architecture

What is Docker?

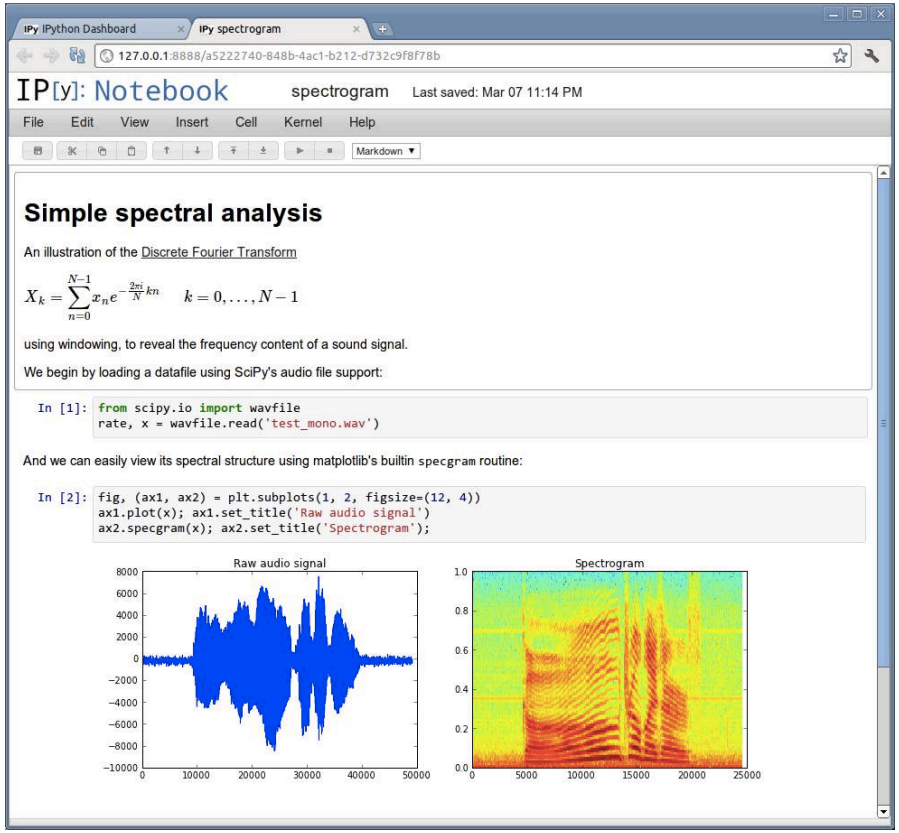
- Container technology: bundles every part of an application
- Provides isolation for each application without the overhead of running a virtual machine
  - Ships only the parts that are needed—leaves out the operating system

Why should business care?

- Docker makes better use of server resource than virtual machines
- Docker provides a fast and reliable way of deploying applications: it's the ideal packaging mechanism for scale-out distributed systems
- Docker makes it easy for developers to work in an environment identical to production
  - Sharing containers leads to innovation

What are Notebooks?

- Interactive documents that contain a program and its output
  - Long history: Mathematica
- Particularly successful with data science
- Projects to watch
  - Jupyter https://jupyter.org/
  - Apache Zeppelin https://zeppelin.incubator.apache.org/



Screenshot from ipython.org

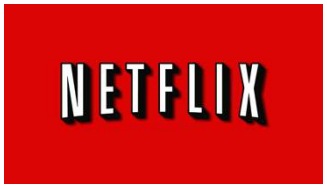
Why should business care?

- Notebooks allow easy collaboration and sharing of data science (think “docker for analysis”)
- Notebooks allow analysts and data scientists easy access to data and compute resource
- Notebooks are a building block for enabling employees with more self-service analytical capabilities
  - Commercial version of this is Databricks Cloud

Data is your business

SILICON VALLEY'S DATA MACHINE

Google Shopping Express



TESLA MOTORS

STITCH FIX™

THE EXPERIMENTAL ENTERPRISE

Data science allows us to observe our experiments and respond to the changing environment.

We need to both support investigative work and build a solid layer for production.

The foundation of the experimental enterprise focuses on making infrastructure readily accessible.

BECOME DATA NATIVE

- Can only win with situational awareness
- New architectures offer new opportunities
- Creation of data-driven value requires new approach
- Create an Experimental Enterprise
- Business must lead, and understand the potential of the technology

edd@svds.com
@edd

Yes, we're hiring!
info@svds.com