Big Data in Production: Lessons from Running in the Cloud

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Amazon Web Services

SPARK SUMMIT 2016

DATA SCIENCE AND ENGINEERING AT SCALE

JUNE 6-8, 2016 SAN FRANCISCO

From Prototype to Production

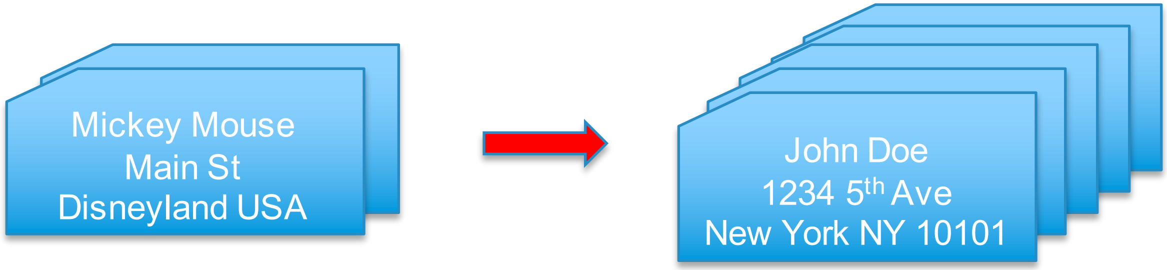
Wow!! I got it to work!

How soon can I have a million of those?

Production “ilities”

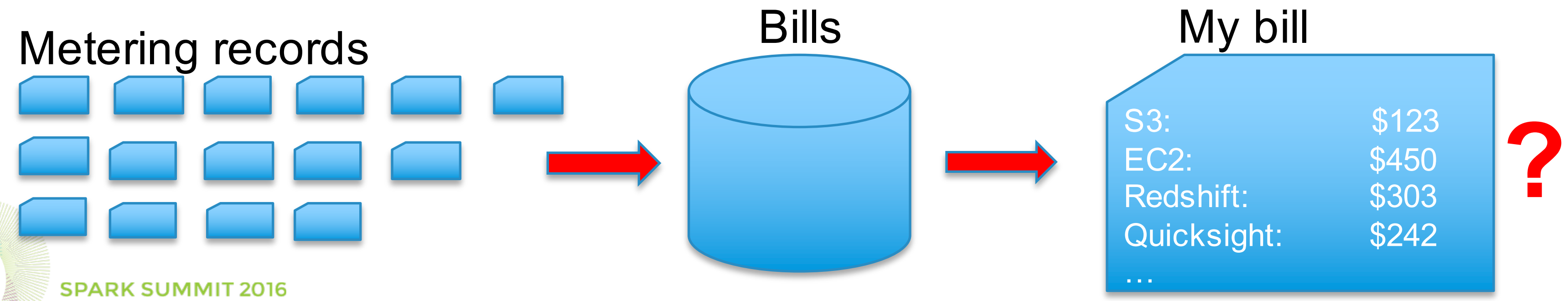
- **Scalability**: many jobs, running day-in and day-out
- **High availability**: no excuses for not delivering results
- **Maintainability**: seamless upgrades, security patches, backups, …
- **Evolvability**: the new person, a year from now, can add new features to your production system
- …

Test Data → Valuable Data



Mickey Mouse
Main St
Disneyland USA

John Doe
1234 5th Ave
New York NY 10101



Metering records

Bills

My bill

S3:	$123
EC2:	$450
Redshift:	$303
Quicksight:	$242
…	

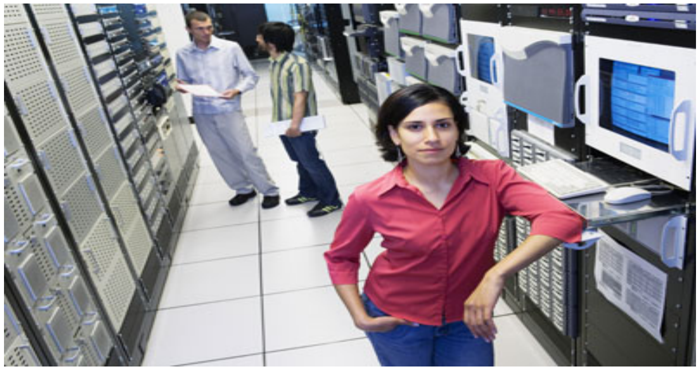
Algorithmic efficiency → "mundane" efficiency

Constants matter

vs.

The never-ending battle against waste

Fine-Grained Control vs. Ease-of-Use



vs.

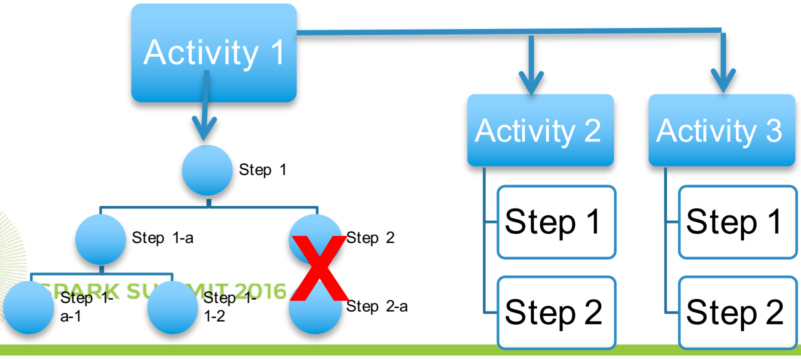
You’ll never believe the variety of workloads they’ll feed you

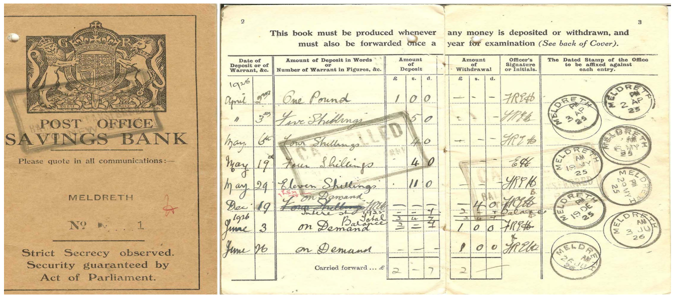
Scale → Automation

High Availability

Single points of failure vs. “large scale events”

Where did it go wrong, when, and why??





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Security and Identity/Access Management

Mundane Efficiency

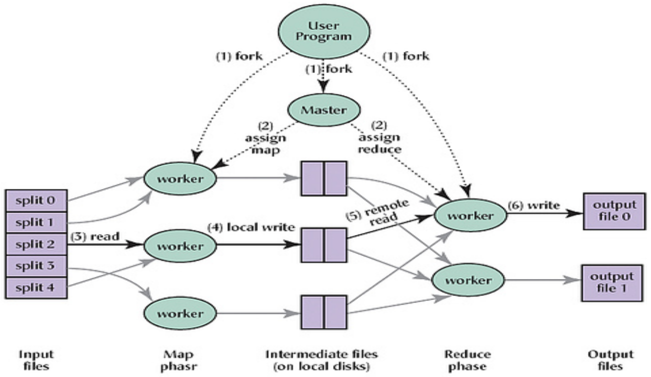
- Support for smart usage: usage reports, billing alerts, cost explorers, life-cycle management, etc.

- Multi-tenant solutions become necessary but take a new way of thinking
  - The cloud is all about elastic resource management. But that’s only part of the solution
  - Also need help with cross-account access management, fine-grained cost/benefit allocation, etc.
  - But things like IAM, detailed billing reports, and Cost Explorer can help.

- Ditto for reusability of services, computations, data, results, etc.

From Pioneers to Settlers

From "do it exactly the way I tell you to" to "just do it"



```
foreach inputDataSet in sources
    computeAlgorithm
```

Production readiness has to be built in

The potential of Big Data

The production use of Big Data

- Automate “everything”
- Security by default
- End-to-end change journals and audit logs
- Serverless, event-driven computing
- Reproducibility, support for data amendments
- Support for relentless cost reduction

Luckily the Cloud can do most of the heavy lifting for you

- CloudFormation, Opsworks, Spark on EMR
- VPC, IAM, Cloudtrail, AWS Config, KMS, ACM, CloudHSM, Inspector
- CloudWatch Logs & Events, Lambda
- Storage life-cycle management
  - S3, Glacier, Snowball, DirectConnect
- Tags, usage reports, billing alerts, cost allocation, detailed billing reports, cost explorers, Trusted Advisor, QuickSight, Redshift

THANK YOU.

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