

STP206

# Building the future of writing with AWS Lambda

**Ellen Musick**

Senior Software Engineer  
Textio

aws  
re:Invent

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aws

The future of writing is knowing how well your words work before anyone reads them. **Textio** is building an augmented writing platform and using AWS to do it. Engineering teams are using Lambda to power the platform through web applications, data science, and infrastructure. This talk covers several different use cases where Lambda has empowered Textio to quickly build and deploy services. This talk also covers Textio's approach to using Lambda as it designs services.

## Agenda

Introduction

When we use AWS Lambda

Web applications

Product services & data science

Infrastructure

## Introduction

## Seeking a media buyer

Recruiting mail for a Marketing role in New York

Hi Mabel,

Our agency needs a killer media buyer. Do you act when you see a problem? Do you dive in and get your hands dirty? Do you have experience in other mediums besides television? If this describes you, that is very helpful. I'd really love to connect with you.

60 Textio Score  
Fair

- Mail is too short
- Add info about the recipient's background
- Needs more paragraphs
- Needs more specific company details
- Write more about company benefits

Slightly masculine tone



## Seeking a media buyer

Recruiting mail for a Marketing role in New York

Hi Mabel,

Our agency needs a killer media buyer. Do you act when you see a problem? Do you dive in and get your hands dirty? Do you have experience in other mediums besides television? If this describes you, that is very helpful. I'd really love to connect with you.

This phrase will increase engagement from men.

Other choices:  
an awesome

60 Textio Score  
Fair

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Slightly masculine tone



## Seeking a media buyer

Recruiting mail for a Marketing role in New York

Hi Mabel,

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66 Textio Score  
Fair

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Neutral tone



## Seeking a media buyer

Recruiting mail for a Marketing role in New York

Hi Mabel,

Our agency needs an awesome media buyer. Do you act when you see a problem? Do you dive in and get your hands dirty? Do you have experience in other mediums besides television? If this describes you, that is very useful. I'd really love to connect with you.

This recruiting jargon is lowering the chance of a positive response to your mail.

Instead, you could try:  
chat  
talk

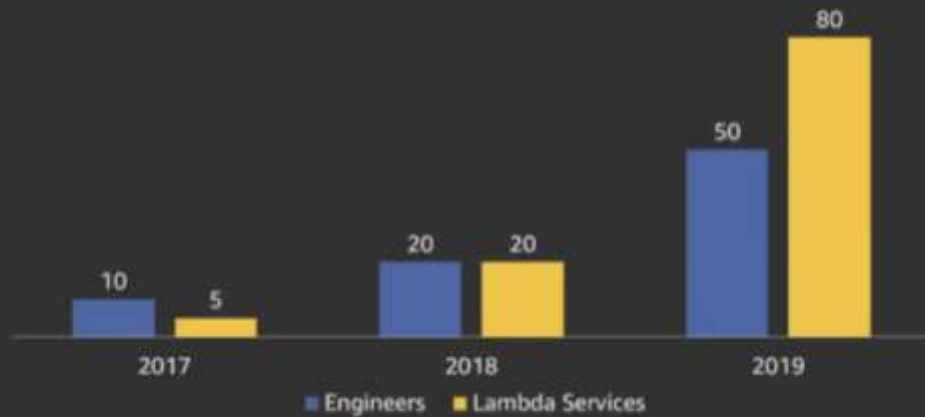
66 Textio Score  
Fair

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Slightly masculine tone



## 3 years of Lambdas



## 80 Lambda services

- API
- Build asset + API for asset
- Extract, Transform, Load (ETL)
- Event stream
- Message translation/forwarding
- Cron
- Infrastructure automation
- Spike/exploration

## When we use Lambda

### Choosing Lambda: Overview

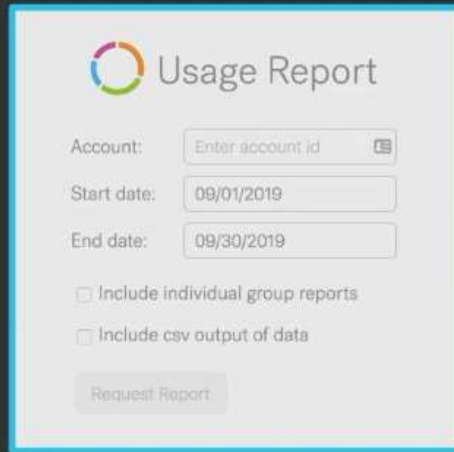
Execution time  
Memory  
Space

Events

Auto scaling  
Low config

Cold start in VPC\*

# Web applications



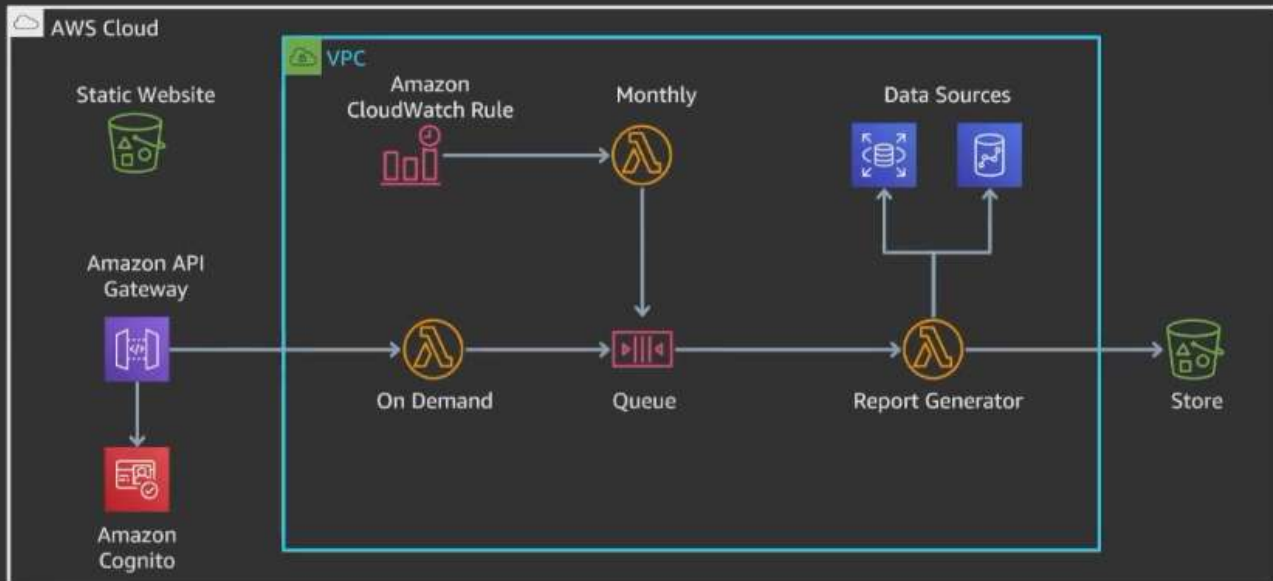
A screenshot of a web form titled "Usage Report". The form has a light blue border and a white background. It contains the following fields and controls:

- Account:** A text input field with the placeholder "Enter account id" and a small icon of a document with a checkmark.
- Start date:** A date input field with the value "09/01/2019".
- End date:** A date input field with the value "09/30/2019".
- Include individual group reports:** A checkbox that is currently unchecked.
- Include csv output of data:** A checkbox that is currently unchecked.
- Request Report:** A button with a light blue background and a white border.

## Scenario: Monthly and on-demand account reports

We can use a CloudWatch event to trigger the monthly report generation.

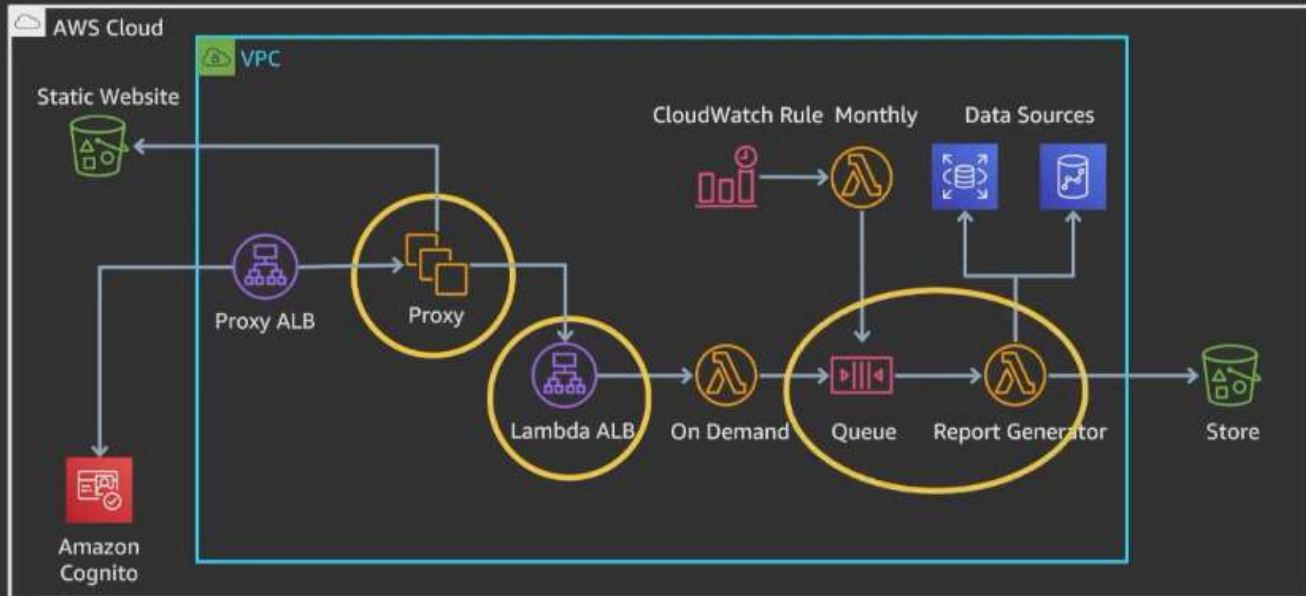
## Architecture: V1



The user clicks for a report within a date range in the static website, this goes through the API Gateway to trigger the **OnDemand** lambda that will put a report request into the queue as a message. The **Report Generator** lambda picks up work and does the work.

# Challenge: Increase security

## Architecture



We use a Proxy to restrict/authorize access to the static website that gets authenticated via Cognito. The token from Cognito is good for a single domain. We then replace the API Gateway with an ALB so that we can use custom domain names for the Lambdas. The Queue-Lambda pattern for the Report Generator allows us to throttle access to the data sources. We set a reserve concurrency for the Report generator Lambda, also set a DLQ and a maximum receive count to 506 and the visibility timeout to 6X the execution time.

## Impact



### Reuse

ALB + Proxy +  
Amazon Cognito



### Cost

ALB vs API Gateway



### Security

Proxy

"Every time I run a usage report, I'm grateful for how incredibly easy and user friendly it is to pull a usage report now, which means I'm WAY more likely to do it, and to find ways to use this meaningful info with our customers. Thanks Komal and Meghan for making this possible."

**Bex, Senior Data Insights Manager**  
**Textio**

## Data science & product services

Collect data from 5 different data sources



Aggregate and analyze to produce business metrics



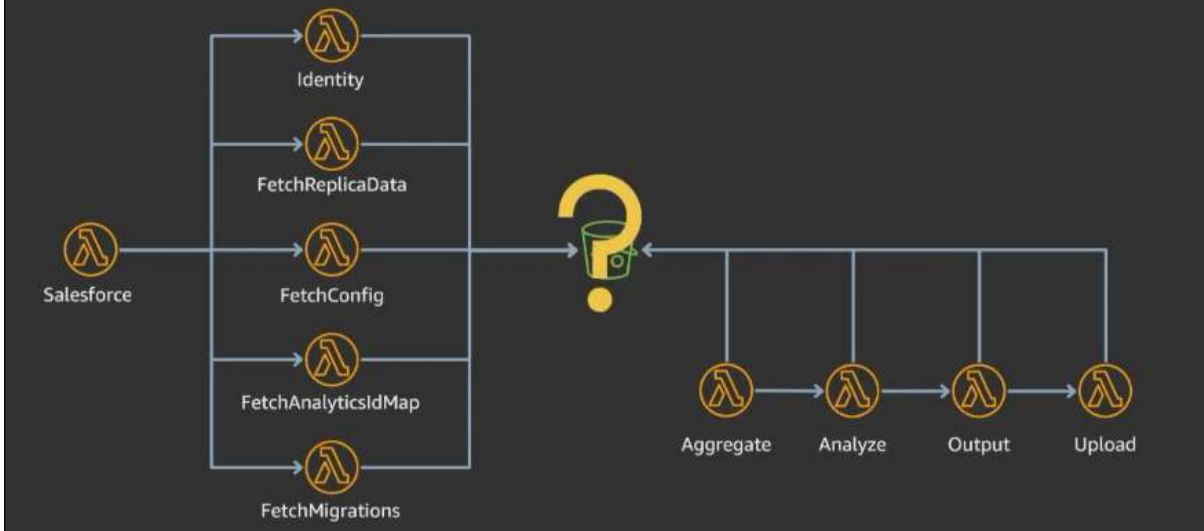
Upload to Salesforce

There are 3 things we want the Jupiter notebook report to do

Scenario: Automate data science



# Architecture?

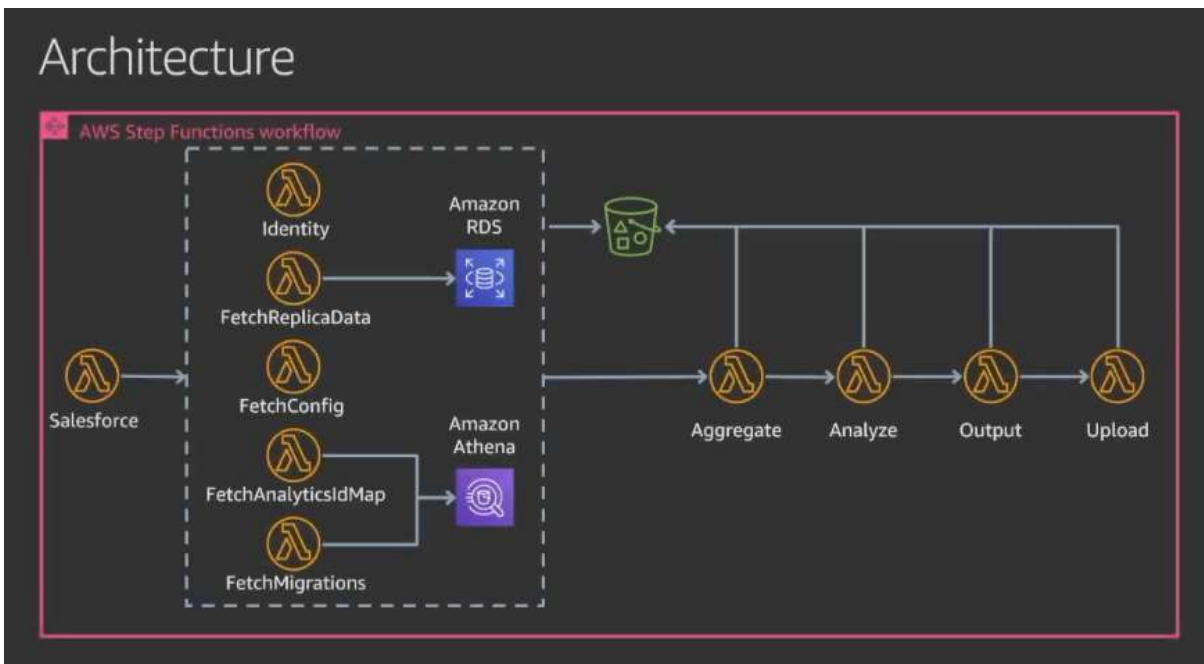


We get some data from Salesforce, then we make parallel calls different data sources using lambdas that will upload their data into S3. Once all the data is in the bucket, it gets aggregate, analyzed, and result output data is created that gets uploaded into the S3 bucket. The challenge is in orchestration.

## Challenge: Orchestration

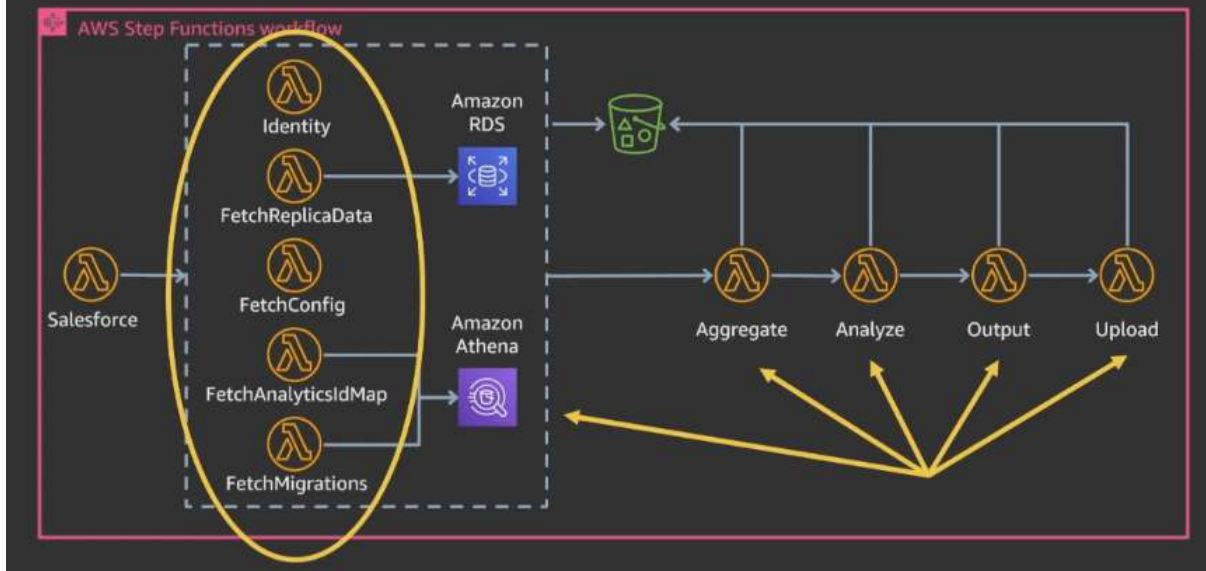
How do we know we can begin the aggregation process step? What happens when an error occurs?

# Architecture

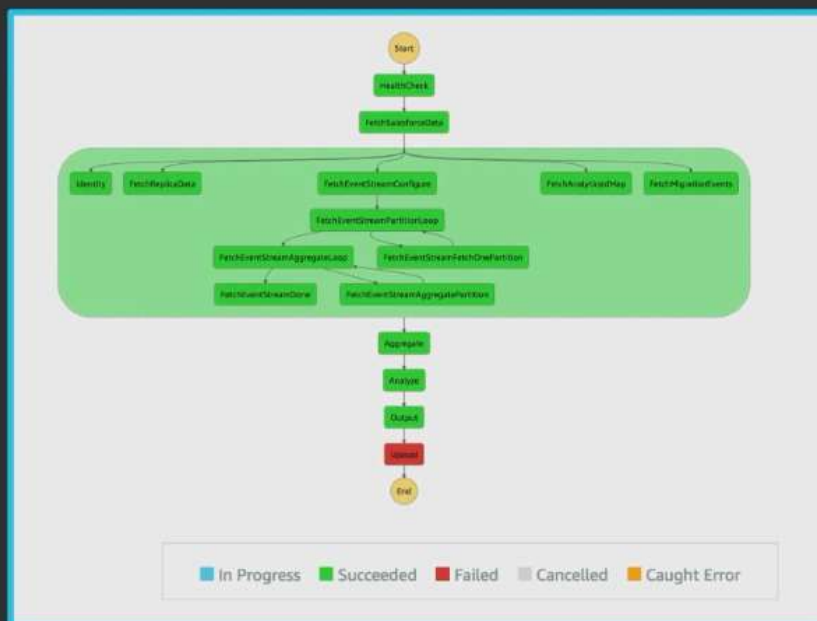


AWS Step Functions allows you to put together tasks or steps in a workflow into a state machine. Each step/tasks can specify what should happen next, tasks can be run in parallel. We define a task state that invokes a Lambda that gets data from Salesforce, this task then specifies the next state that has 5 branches of execution. Each branch is a task state that fetches data and uploads it to S3. The Step Function service takes care of knowing when the parallel steps of execution are completed and the next state can begin.

# Architecture



We no longer need to write all the code here for error handling. The communication between steps is also handled for us by the Step Function service, it also passes the output of one stage as the input to the next state or you can use S3 to store large data that needs to be passed. You can also pass conditions that need to be satisfied.





## Impact



### New pattern

Automate Jupyter  
Notebook



### Signal

Better understand  
customer experience

We now have a new pattern to share data between Jupyter notebooks and Lambdas to extract shared libraries for reuse.

“Having the ability to track statistically significant retention metrics at this stage of Textio’s journey is an impressive accomplishment. The signal that these metrics give the customer success team is incredibly important when we look at a holistic view of customer health.”

**Liz, Manager, Customer Success**  
**Textio**

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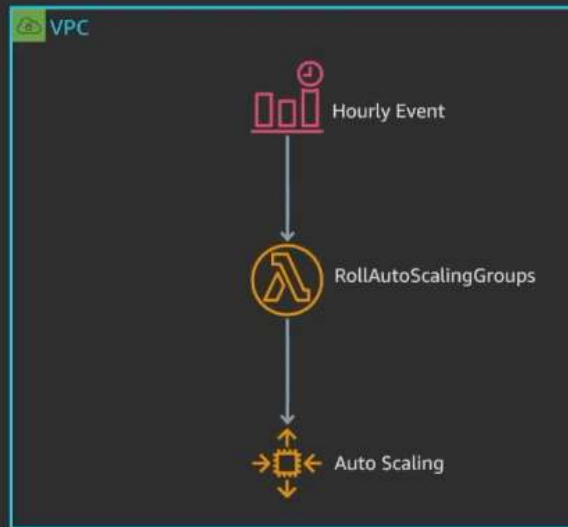


## Infrastructure

We are responsible for maintaining our containers and we generally use Lambda to extend our services. We need to update CloudFormation to auto-scale or make AMI changes and then deploy the new CF template, we need to automate this using a Lambda.

Scenario: Automate rolling out AMI changes

## EC2: Roll Auto Scaling groups



**Challenge:** Amazon ECS doesn't drain containers\*

## Amazon ECS: Handle lifecycle event



## Impact



Save time  
No manual work



Reduce error  
No manual work



Security  
Roll out patches

## Conclusion

Extend features 

Automate 

Move off your machine 

Fit: Does the work fit?

Trigger: Is there a matching trigger?

Optimize: What do you want to optimize?

# Thank you!

**Ellen Musick**

ellen@textio.com

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