



BUILDING SERVERLESS APPLICATIONS IN AWS WORKSHOP

<https://goo.gl/UszEUj>

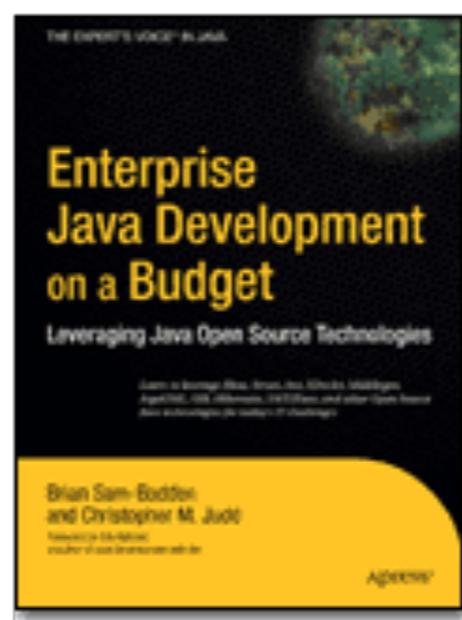
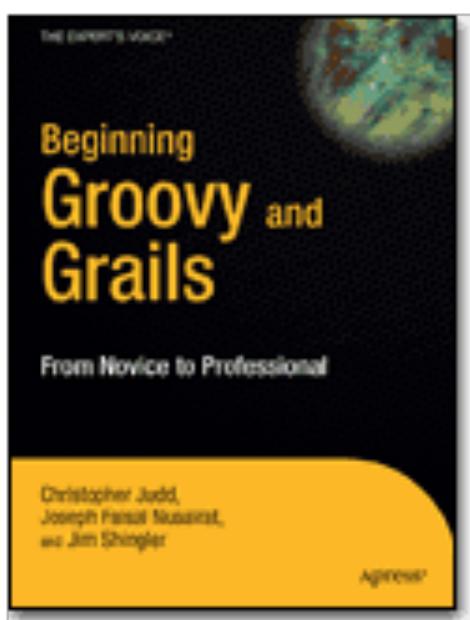
Christopher M. Judd
&
Jarred Olson

Christopher M. Judd

CTO and Partner at



Central Ohio Java Users Group leader



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Getting Started With Docker
By Christopher M. Judd

ABOUT DOCKER

Almost overnight, Docker has become the de facto standard for developers and system administrators to use for package deployment and managing distributed applications. It provides tools for simplifying DevOps by enabling developers to create templates called images that can be used to create lightweight virtual machines that run the code within their applications and all of their application's dependencies. These lightweight virtual machines can be promoted through testing and production environments where sysadmins deploy and run them.

Docker makes it easier for organizations to automate infrastructure, isolate applications, maintain consistency, and improve resource utilizations.

Similar to the popular version control software Git, Docker has a social aspect, in that developers and sysadmins are able to share their images via Docker Hub.

Docker is an open-source solution that runs natively on Linux but also works on Windows and is being a rapidly growing technology in the enterprise. Many tools have also grown up around Docker to make it easier to manage and orchestrate complex distributed applications.

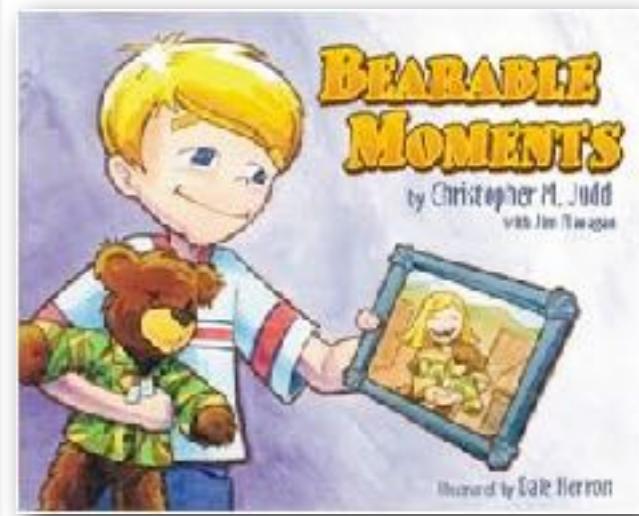
DOCKER ARCHITECTURE

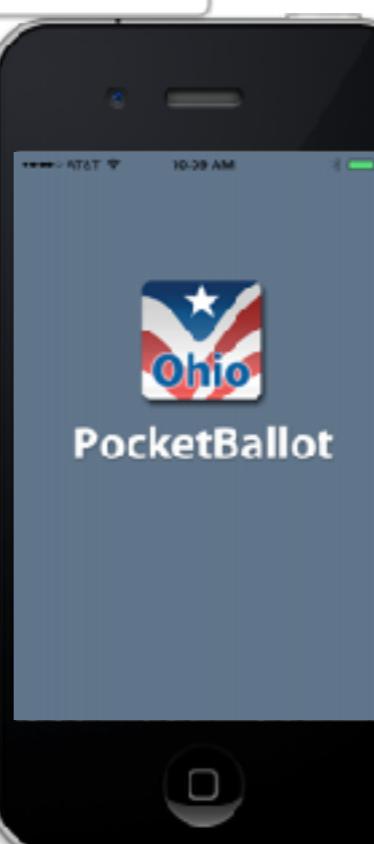
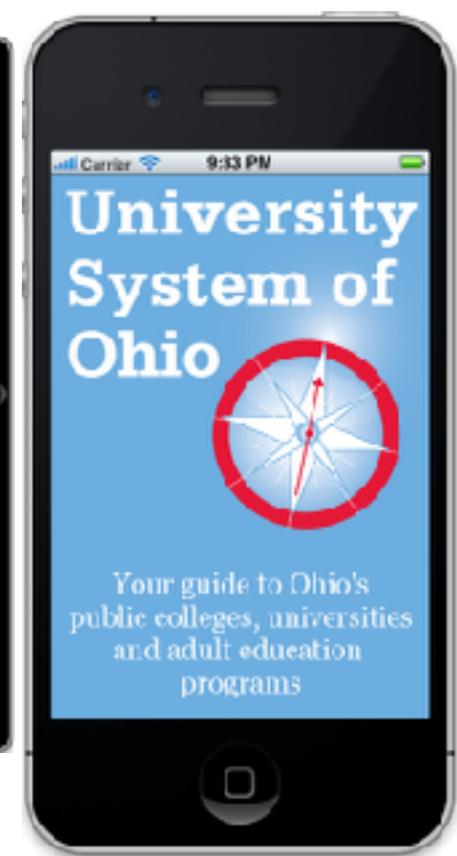
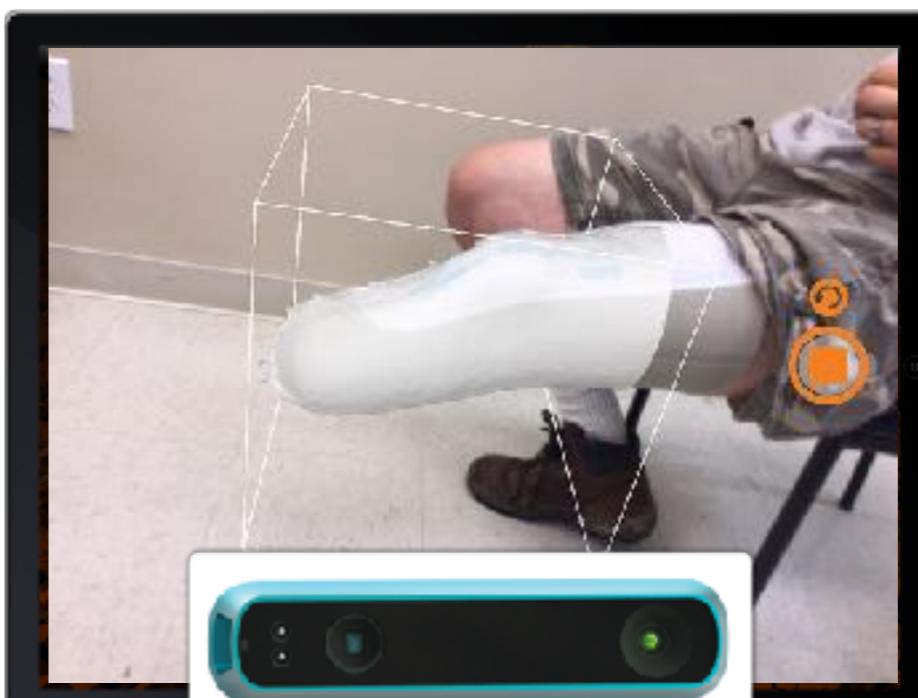
Docker utilizes a client-server architecture and a remote API to manage and create Docker containers built upon Linux containers. Docker containers are created from Docker images. The relationship between containers and images are analogous to the relationship between objects and classes in object-oriented programming.

Site24x7
DOCKER MONITORING
Get Detailed Insight into Docker Containers

LEARN MORE >

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LIMBLOGIC

SERVERLESS

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VOOR



What is Serverless

Serverless computing, also known as Function as a Service (FaaS), is a cloud computing code execution model in which the cloud provider fully manages starting and stopping virtual machines as necessary to serve requests, and requests are billed by an abstract measure of the resources required to satisfy the request, rather than per virtual machine, per hour.

Despite the name, it does not actually involve running code without servers. Serverless computing is so named because the business or person that owns the system does not have to purchase, rent or provision servers or virtual machines for the back-end code to run on.

Serverless code can either be triggered by specific events (such as user registration with Amazon Cognito), or be configured to run behind an API management platform in order to expose it as a REST API endpoint.



What is Serverless

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Software as a service (SaaS) - “on-demand” software



Platform as a service (PaaS) - solution stack



Infrastructure as a service (IaaS) - virtual computing infrastructure



Backend as a service (BaaS) - “on-demand” service



Function as a service (FaaS) - hosted event-based functions



SaaS



BaaS



IaaS



PaaS



FaaS







```
'use strict';

console.log('Loading function');

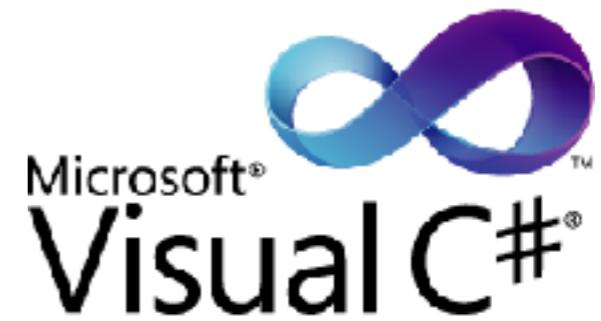
exports.handler = (event, context, callback) => {
    //console.log('Received event:', JSON.stringify(event, null, 2));
    console.log('value1 =', event.key1);
    console.log('value2 =', event.key2);
    console.log('value3 =', event.key3);
    callback(null, event.key1); // Echo back the first key value
    //callback('Something went wrong');
};
```



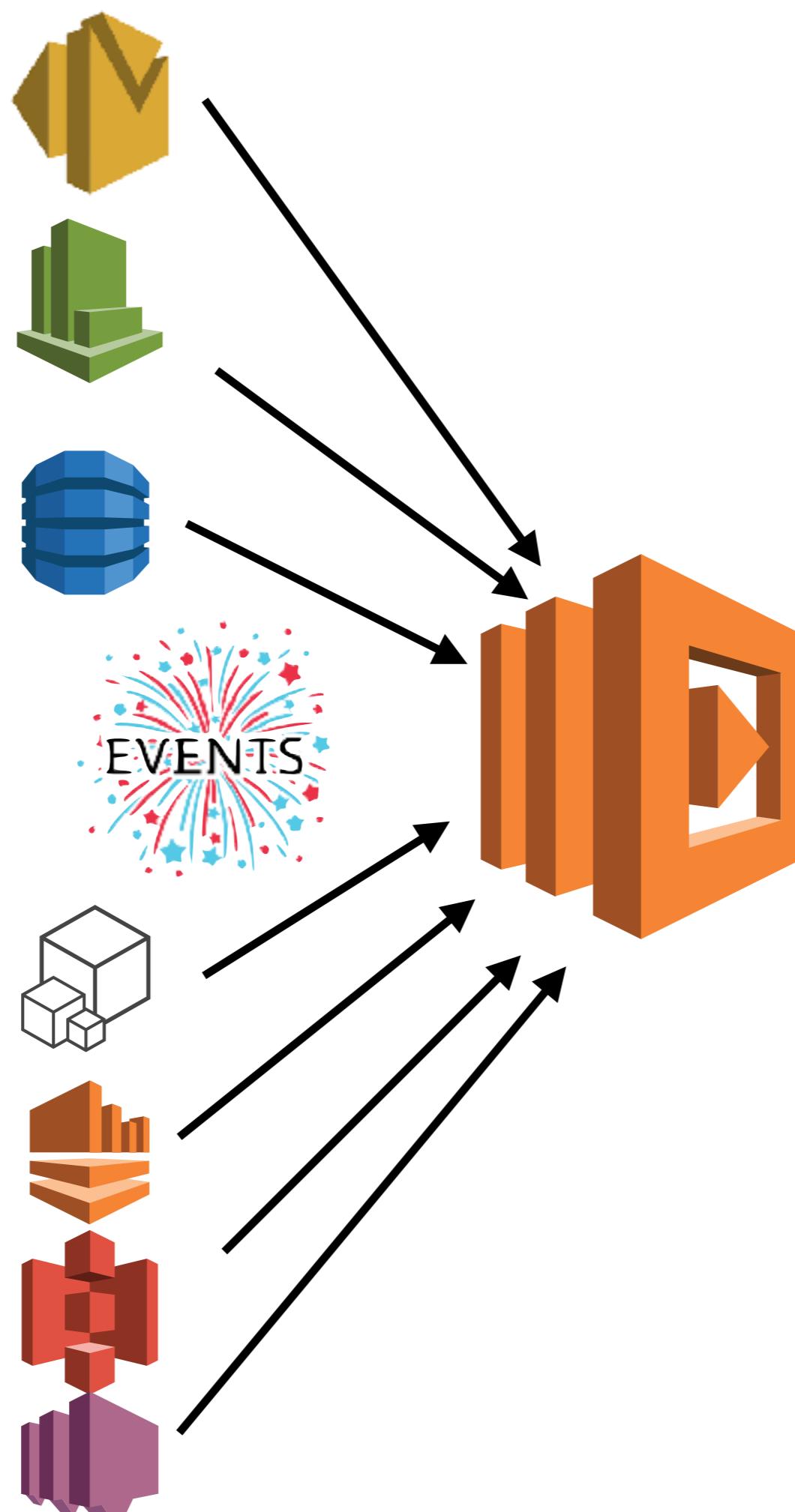
```
'use strict';

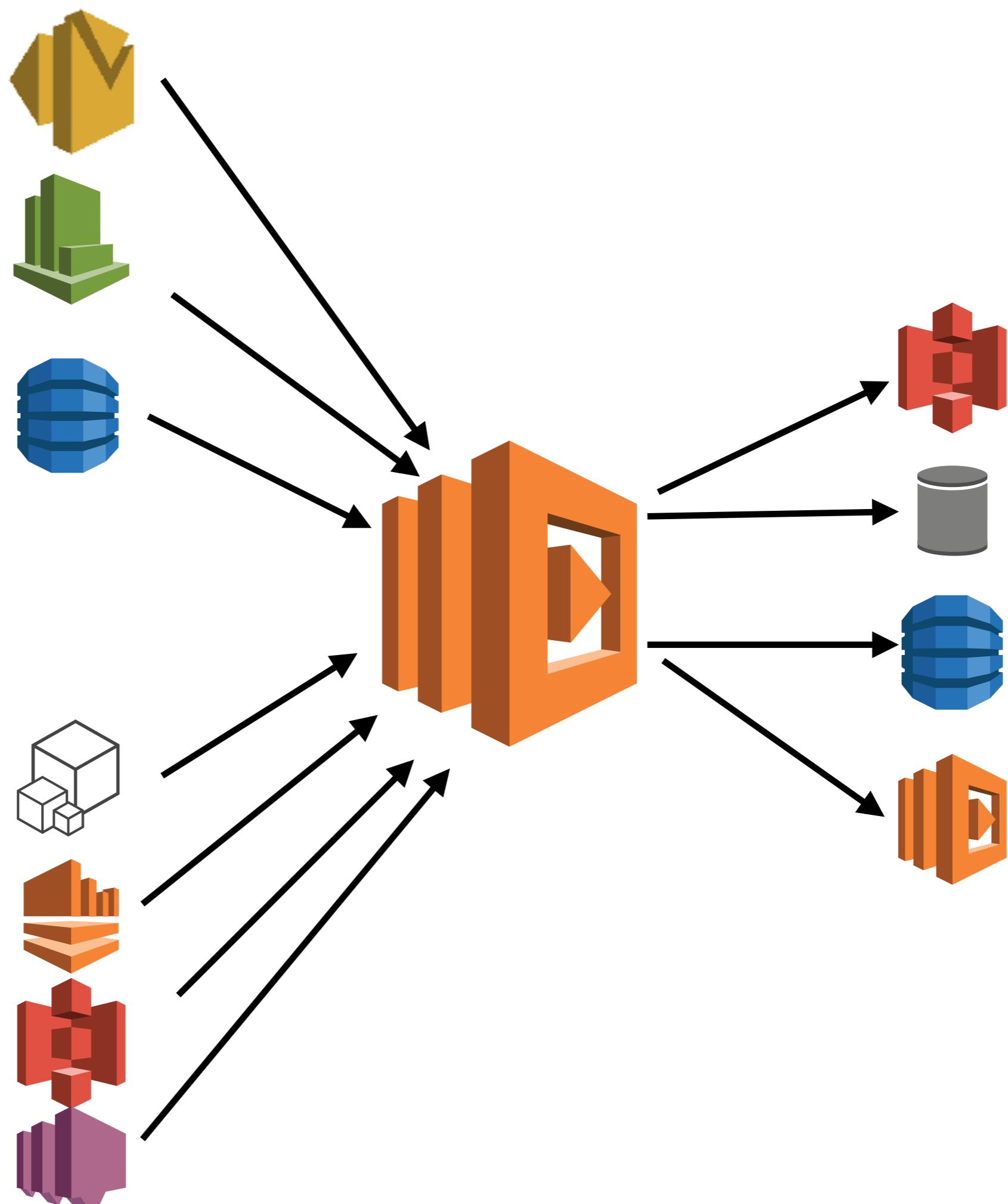
console.log('Loading function');

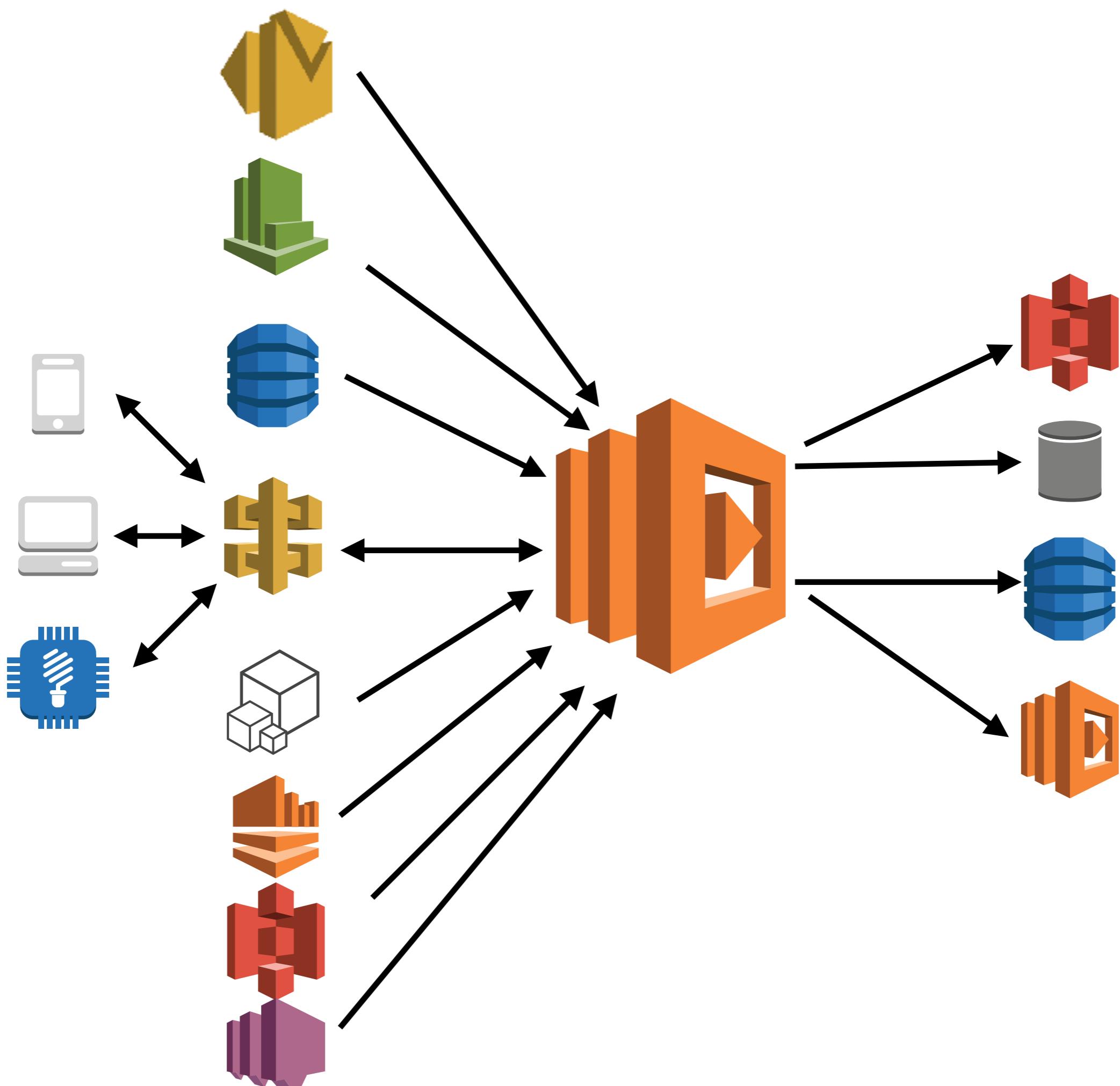
exports.handler = (event, context, callback) => {
  //console.log('Received event:', JSON.stringify(event, null, 2));
  console.log('value1 =', event.key1);
  console.log('value2 =', event.key2);
  console.log('value3 =', event.key3);
  callback(null, event.key1); // Echo back the first key value
  //callback('Something went wrong');
};
```











S E T U P



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Node.js® is a JavaScript runtime built on [Chrome's V8 JavaScript engine](#). Node.js uses an event-driven, non-blocking I/O model that makes it lightweight and efficient. Node.js' package ecosystem, [npm](#), is the largest ecosystem of open source libraries in the world.

Download for macOS (x64)

[v6.9.2 LTS](#)

Recommended For Most Users

[v7.2.1 Current](#)

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Or have a look at the [LTS schedule](#).

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RESOURCES

[AWS Command Line Interface](#) >

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[Documentation](#)[Tools](#)[Release Notes](#)

Manage Your Resources

Sign In to the Console

AWS Command Line Interface

The AWS Command Line Interface (CLI) is a unified tool to manage your AWS services. With just one tool to download and configure, you can control multiple AWS services from the command line and automate them through scripts.

The AWS CLI introduces a new set of simple [file commands](#) for efficient file transfers to and from Amazon S3.

[Getting Started »](#)[CLI Reference »](#)[GitHub Project »](#)[Community Forum »](#)**Windows**

Download and run the [64-bit](#) or [32-bit](#) Windows installer.

Mac and Linux

Requires [Python 2.6.5](#) or higher.
Install using [pip](#).

```
pip install awscli
```

Amazon Linux

The AWS CLI comes pre-installed on [Amazon Linux AMI](#).

Release Notes

Check out the [Release Notes](#) for more information on the latest version.

GitHub - cjudd/giftube-lambda

GitHub, Inc. [US] https://github.com/cjudd/giftube-lambda

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Code Issues 0 Pull requests 0 Projects 0 Pulse Graphs

No description or website provided.

4 commits 1 branch 0 releases 1 contributor

Branch: master New pull request Find file Clone or download

		Latest commit <code>8be30d1</code> 3 minutes ago
	authorizer	Added authorizer npm package description.
	getGifs	Added getGifs npm package description.
	getTemporaryCredentials	Added get temporary credential npm package description.
	gifProcessor	Added gif processor npm package description.

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git clone https://github.com/cjudd/giftube-lambda.git

GitHub - cjudd/giftube: giftube

GitHub, Inc. [US] https://github.com/cjudd/giftube

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Code Issues 0 Pull requests 0 Projects 0 Pulse Graphs

giftube.tech website for demonstrating AWS Lambda and API Gateway demos

10 commits 2 branches 0 releases 2 contributors

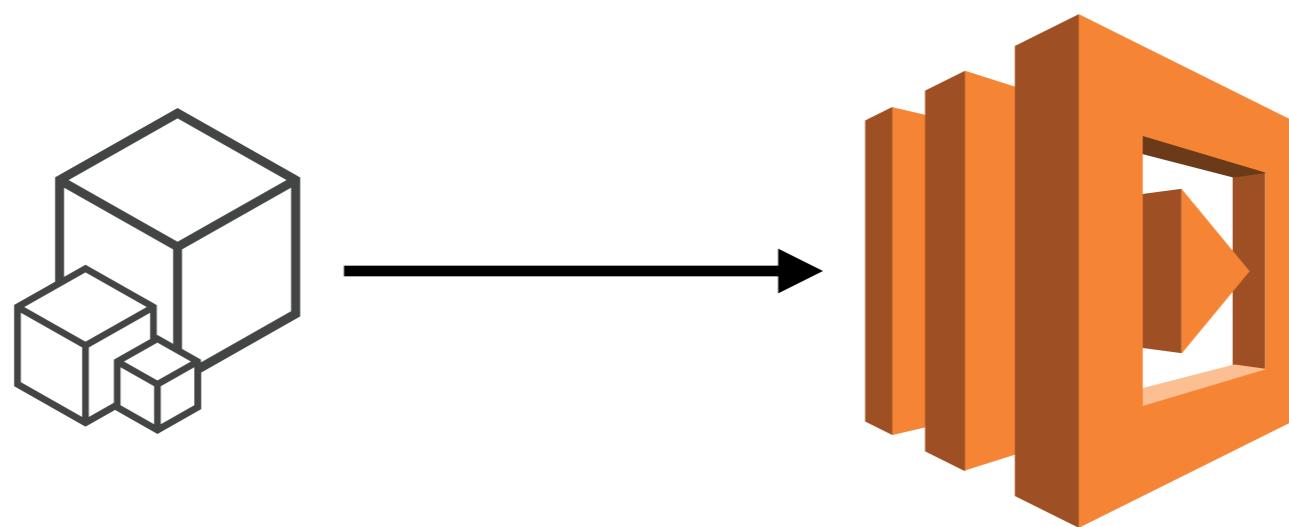
Branch: master New pull request Find file Clone or download

cjudd Import Giftube ApiService. Latest commit 6fbcccc on Dec 7, 2016

e2e	chore: initial commit from angular-cli	a month ago
src	Import Giftube ApiService.	a month ago
.editorconfig	chore: initial commit from angular-cli	a month ago
.gitignore	chore: initial commit from angular-cli	a month ago
README.md	chore: initial commit from angular-cli	a month ago
angular-cli.json	chore: initial commit from angular-cli	a month ago
karma.conf.js	chore: initial commit from angular-cli	a month ago
package.json	chore: initial commit from angular-cli	a month ago
protractor.conf.js	chore: initial commit from angular-cli	a month ago
tslint.json	chore: initial commit from angular-cli	a month ago
README.md		

git clone https://github.com/cjudd/giftube.git

FIRST LAMBDA





AWS Lambda

AWS Lambda is a compute service that runs developers' code in response to events and automatically manages the compute resources for them, making it easy to build applications that respond quickly to new information.

[Get Started Now](#)



[Learn more about AWS Lambda](#)



Respond quickly to new information

AWS Lambda runs your code in response to events such as image uploads, in-app activity, website clicks, or outputs from connected devices. You can use AWS Lambda to add custom logic to other AWS services or create your own backend service that operates at AWS scale, performance, and security.



Run your code without managing infrastructure

AWS Lambda administers the underlying compute resources, including server and operating system maintenance, capacity provisioning, automatic scaling, code monitoring, logging, and code and security patch deployment.

All you need to do is write the code.



Cost-effective and efficient

AWS Lambda runs your code only when needed, with no unnecessary overhead or cost.

AWS Lambda Documentation and Support

[Getting Started Guide](#) | [Documentation](#) | [Support](#) | [Forums](#)

Lambda > New function

[Select blueprint](#)[Configure triggers](#)[Configure function](#)[Review](#)

Select blueprint



Blueprints are sample configurations of event sources and Lambda functions. Choose a blueprint that best aligns with your desired scenario and customize as needed, or skip this step if you want to author a Lambda function and configure an event source separately. Except where otherwise noted, blueprints are licensed under [CC0](#).

Welcome to AWS Lambda! You can get started on creating your first Lambda function by choosing one of the blueprints below.

[Select runtime](#)[Filter](#)[Viewing 1-9 of 71](#)

Blank Function

Configure your function from scratch.
Define the trigger and deploy your code
by stepping through our wizard.

[custom](#)

kinesis-firehose-syslog-to-json

An Amazon Kinesis Firehose stream
processor that converts input records
from RFC3164 Syslog format to JSON.

[nodejs · kinesis-firehose](#)

alexa-skill-kit-sdk-factskill

Demonstrate a basic fact skill built with
the ASK NodeJS SDK

[nodejs · alexa](#)

kinesis-firehose-apachelog-to...

An Amazon Kinesis Firehose stream
processor that converts input records
from Apache Common Log format to

[python2.7 · kinesis-firehose](#)

cloudfront-modify-response-h...

Blueprint for modifying CloudFront
response header implemented in
NodeJS.

[nodejs · cloudfront · response header](#)

s3-get-object-python

An Amazon S3 trigger that retrieves
metadata for the object that has been
updated.

[python2.7 · s3](#)

config-rule-change-triggered

An AWS Config rule that is triggered by
configuration changes to EC2 instances.
Checks instance types.

[nodejs4.3 · config](#)

dynamodb-process-stream

An Amazon DynamoDB trigger that logs
the updates made to a table.

[nodejs · dynamodb](#)

microservice-http-endpoint

A simple backend (read/write to
DynamoDB) with a RESTful API
endpoint using Amazon API Gateway.

[nodejs · api-gateway](#)[Cancel](#)

Lambda > New function

[Select blueprint](#)**Configure triggers**[Configure function](#)[Review](#)

Configure triggers

You can choose to add a trigger that will invoke your function.

[Remove](#)[Cancel](#)[Previous](#)[Next](#)

Lambda > New function

[Select blueprint](#)[Configure triggers](#)**Configure function**[Review](#)

Configure function

A Lambda function consists of the custom code you want to execute. [Learn more](#) about Lambda functions.

Name* cmjlHelloWorld 

Description

Runtime* Node.js 4.3 

Lambda function code

Provide the code for your function. Use the editor if your code does not require custom libraries (other than the aws-sdk). If you need custom libraries, you can upload your code and libraries as a .ZIP file. [Learn more](#) about deploying Lambda functions.

Code entry type [Edit code inline](#) 

```
1 exports.handler = (event, context, callback) => {  
2     console.log('*** CALLED FIRST LAMDA ***', event)  
3     callback(null, 'Hello from Lambda')  
4 };
```



Environment variables	Key	Value
-----------------------	-----	-------

Lambda function handler and role

Handler* index.handler

Role* Choose an existing role

Existing role* lambda_execute_role

Advanced settings

These settings allow you to control the code execution performance and costs for your Lambda function. Changing your resource settings (by selecting memory) or changing the timeout may impact your function cost. Learn more about how Lambda pricing works.

Memory (MB)* 128

Timeout* 0 min 3 sec

AWS Lambda will automatically retry failed executions for asynchronous invocations. You can additionally optionally configure Lambda to forward payloads that were not processed to a dead-letter queue (DLQ), such as an SQS queue or an SNS topic. Learn more about Lambda's retry policy and DLQs. Please ensure your role has appropriate permissions to access the DLQ resource.

DLQ Resource Select resource

All AWS Lambda functions run securely inside a default system-managed VPC. However, you can optionally configure Lambda to access resources, such as databases, within your custom VPC. Learn more about accessing VPCs within Lambda. Please ensure your role has appropriate permissions to configure VPC.

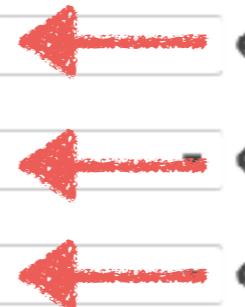
VPC No VPC

Environment variables are encrypted at rest using a default Lambda service key. You can change the key below to one of your account's keys or paste in a full KMS key ARN.

KMS key (default) aws/lambda

* These fields are required.

Cancel Previous Next



```
exports.handler = (event, context, callback) => {
  console.log('*** CALLED FIRST LAMBDA ***', event);
  callback(null, 'Hello from Lambda');
};
```

Lambda function code

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Code entry type

Edit code inline

```
1- exports.handler = (event, context, callback) => {  
i 2     console.log('*** CALLED FIRST LAMBDA ***', event)  
3     callback(null, 'Hello from Lambda')  
4 };
```



You can define Environment Variables as key-value pairs that are accessible from your function code. These are useful to store configuration settings without the need to change function code. [Learn more](#). For storing sensitive information, we recommend encrypting values using KMS and the console's encryption helpers.

Enable encryption helpers

Environment variables

Key

Value



Lambda function handler and role

Handler*

index.handler



Role*

Choose an existing role



Lambda > New function

[Select blueprint](#)[Configure triggers](#)[Configure function](#)**Review****Review**

Please review your Lambda function details. You can go back to edit changes for each section. When you are ready, click **Create function** to complete the setup process.

Lambda function[Edit](#)**Name** cmjHelloWorld**Description****Runtime** Node.js 4.3**Environment variables****Handler** index.handler**Existing role*** lambda_execute_role**DLQ Resource****Memory (MB)** 128**Timeout** 3**VPC** No VPC**KMS key** (default) aws/lambda[Cancel](#)[Previous](#)[Export function](#)[Create function](#)

AWS Lambda

Dashboard

Functions

Lambda > Functions > cmjHelloWorld

ARN - arn:aws:lambda:us-west-2:563700736850:function:cmjHelloWorld

Qualifiers

Test

Actions



Congratulations! Your Lambda function "cmjHelloWorld" has been successfully created. You can now click on the "Test" button to input a test event and test your function.

Code

Configuration

Triggers

Monitoring



Code entry type

Edit code inline



```
1- exports.handler = (event, context, callback) => [
i 2      console.log('*** CALLED FIRST LAMBDA ***', event)
3      callback(null, 'Hello from Lambda')
4  ];
```



You can define Environment Variables as key-value pairs that are accessible from your function code. These are useful to store configuration settings without the need to change function code. [Learn more](#). For storing sensitive information, we recommend encrypting values using KMS and the console's encryption helpers.

Enable encryption helpers

Environment variables

Key

Value



AWS Lambda

Lambda > Functions > cmjHelloWorld

ARN - arn:aws:lambda:us-west-2:563700736850:function:cmjHelloWorld

Dashboard

Functions

Qualifiers ▾

Test

Actions ▾

Input test event

x



Use the editor below to enter an event to test your function with. You can edit the event again by choosing **Configure test event** in the Actions list. Note that changes to the event will only be saved locally.

Sample event template

Hello World



```
1 [  
2   "key3": "value3",  
3   "key2": "value2",  
4   "key1": "value1"  
5 ]
```



Cancel

Save

Save and test



S | Services | Resource Groups | cjudd | cjudd@5637-0073-6850 | Oregon | Support

AWS Lambda

Lambda > Functions > cmjHelloWorld

ARN - arn:aws:lambda:us-west-2:563700736850:function:cmjHelloWorld

Dashboard Functions

Qualifiers Test Actions

Code Configuration Triggers Monitoring

Code entry type Edit code inline

```
1 exports.handler = (event, context, callback) => {  
2     console.log('*** CALLED FIRST LAMBDA ***', event)  
3     callback(null, 'Hello from Lambda')  
4 };
```

Execution result: succeeded (logs)

The area below shows the result returned by your function execution. Learn more about returning results from your function.

"Hello from Lambda"

Summary

Code /4IGGfa1QzYEswX00Eaubq

SHA-256 EmF4ftlIk594UcqCbQXIhas

=

Request 0397cd21-d7a3-11e6-8fda-

ID 35d4c5ac1dd6

Duration 191.48 ms

Billed 200 ms
duration

Resources 128 MB
configured

Max 10 MB

Log output

The area below shows the logging calls in your code. These correspond to a single row within the CloudWatch log group corresponding to this Lambda function. Click here to view the CloudWatch log group.

START RequestId: 0397cd21-d7a3-11e6-8fda-35d4c5ac1dd6 Version: \$LATEST
2017-01-11T02:09:42.297Z 0397cd21-d7a3-11e6-8fda-35d4c5ac1dd6 ***
END RequestId: 0397cd21-d7a3-11e6-8fda-35d4c5ac1dd6
REPORT RequestId: 0397cd21-d7a3-11e6-8fda-35d4c5ac1dd6 Duration: 191.48 ms

START RequestId: 0397cd21-d7a3-11e6-8fda-35d4c5ac1dd6 Version: \$LATEST
2017-01-11T02:09:42.297Z 0397cd21-d7a3-11e6-8fda-35d4c5ac1dd6 *** CALLED FIRST
LAMDA *** { key3: 'value3', key2: 'value2', key1: 'value1' }
END RequestId: 0397cd21-d7a3-11e6-8fda-35d4c5ac1dd6
REPORT RequestId: 0397cd21-d7a3-11e6-8fda-35d4c5ac1dd6 Duration: 191.48 msBilled
Duration: 200 ms Memory Size: 128 MBMax Memory Used: 10 MB

```
aws lambda invoke \
--invocation-type RequestResponse \
--function-name cmjHelloWorld \
--log-type Tail \
--payload '{"key1":"value1", "key2":"value2", "key3":"value3"}' \
--profile aws-pres \
outfile.txt
```

```
{  
    "LogResult":  
"U1RBULQgUmVxdWVzdElk0iBkYWew0WZjMy1iYjMxLTExZTYt0GJjZi02MzIzYzM2MjIxN2EgVmVyc2lvbjogJExBVEVTVAoyMDE2LTEyLTA1VDIx0jI50jA3Ljc4N1oJZGFhMDlmYzMtYmIzM0xMWU2LThiY2YtNjMyM2MzNjIyMTdhCRoaXMgaXMgYSBsb2dnZWQgZXZlbnQKRU5EIFJlcXVlc3RJZDogZGFhMDlmYzMtYmIzM0xMWU2LThiY2YtNjMyM2MzNjIyMTdhClJFUE9SVCBSZXF1ZXN0SWQ6IGRhYTA5ZmMzLWJiMzEtMTFlNi04YmNmLTyzMjNjMzYyMjE3YQlEdXJhdGlvbjogMS420CBtcwlCaWxsZWQgRHVyYXRpb246IDEwMCBtcyAJTWVtb3J5IFNpemU6IDEyOCBNQglNYXggTwVtb3J5IFVzZWQ6IDkgTUIJCg==",  
    "StatusCode": 200  
}
```

outfile.txt

"Hello from Lambda"

BASE64

Decode and Encode

Have to deal with Base64 format? Then this site is made for you! Use the super simple online form below to decode or encode your data. If you're interested about the inner workings of the Base64 format, just read the detailed description at the bottom of the page. Welcome!

[Decode](#)[Encode](#)[Other tools](#)[Like 2K](#)[Do you like us?](#)

Decode from Base64 format

Simply use the form below

```
U1RBIJQgUmVxdWVzdEjkCiBIODY3MGVjMiByZDQ5LTExZTctYTVmMy0zMTE5MDVjZjMzZGFgV  
mVyc2IvbjogJExBVEVTVAcyMDE3LTA0LTMwVDAyOjA4OjMxLjM3NVoJZTg2NzBiYzIlMmQ0OS0x  
MWU3LWE1ZjMiMzExOTA1Y2YzM2RhCSoqKiBDQUxMRUQgRkISU1QgTEFNQkRBICoqKiB7IGtI  
eTE6ICd2YWx1ZTEnIH0KRU5EIFJlcXVlc3RJZDogZTg2Nz3lYzItMmQ0CS0xMWU3LWE1ZjMiMz  
ExOTA1Y2YzM2RhCJFUE9SVCBSZXF1ZXN0SWQ6IGU4NjcwZWMyLTJKNDktMTFINy1hNWYzL  
TMxMTkwNWNmMzNkYQIEdXJhdGvbjogNi41OCBtcwlCaWxsZWQgRHVYXRpb246IDEwMCBtc  
yAJTWVlb3J5IFNpemU6IDEyOCBNQgINYXggTWVtb3J5IFVzZWQ6IDI0IE1CCQo=
```

[◀ DECODE ▶](#)

UTF-8

You may also select input charset.

 Live mode OFF

Decodes while you type or paste (in strict mode).

 UPLOAD FILE

Decodes an entire file (max. 10MB).



ISSUE TRACKER FOR
TRUE DEVELOPERS

GET STARTED
FREE

```
START RequestId: e8670ec2-2d49-11e7-a5f3-311905cf33da Version: SLATEST  
2017-04-30T02:08:31.375Z e8670ec2-2d49-11e7-a5f3-311905cf33da *** CALLED FIRST  
LAMBDA *** [key1: 'value1']  
END RequestId: e8670ec2-2d49-11e7-a5f3-311905cf33da  
REPORT RequestId: e8670ec2-2d49-11e7-a5f3-311905cf33da Duration: 6.58 ms Billed  
Duration: 100 ms Memory Size: 128 MB Max Memory Used: 24 MB
```

REST LAMBDA





find packages



sign up or login



Faker public



Generate massive amounts of fake contextual data



```
## USAGE ## browser -  
## node.js -## usage var Faker = require('./Faker'); var randomName =  
Faker.Name.findName(); // Rowan Nikolaus var randomEmail =  
Faker.Internet.email(); // Kassandra.Haley@erich.biz var randomCard =  
Faker.Helpers.createCard(); // random contact card containing many  
properties## API
```

- Name
 - firstName

Manage permissions for
the whole team

Manage developer teams with
varying permissions and multiple
projects. [Learn more about
Private Packages and
Organizations...](#)

[npm install Faker](#)

[how? learn more](#)

[fotoverite published 3 years ago](#)

0.7.2 is the latest of 17 releases

github.com/FotoVerite/Faker.js

Stats

12,213 downloads in the last month

64,918 downloads in the last year

332,436 downloads in the last 30 days

8 open issues on GitHub

2 open pull requests on GitHub

```
cd giftube-lambda  
cd getGifs  
vim index.js
```

```
'use strict';

var faker = require('Faker')

exports.handler = (event, context, callback) => {
    var gifs = [];
    for(var i = 0; i < 10; i++) {

        var gif = {};
        gif.id = faker.random.number(100);
        gif.title = faker.Lorem.sentences(1);
        gif.url = faker.Image.imageUrl(100, 100, 'sports') + "?" + faker.random.number(200);

        gifs.push(gif);
    }

    callback(null, gifs);
}
```

vim package.json

```
{  
  "name": "getGifs",  
  "version": "1.0.0",  
  "description": "Get Gif Lambda",  
  "repository": {  
    "type": "git",  
    "url": "https://github.com/cjudd/giftube-lambda"  
  },  
  "main": "index.js", ←  
  "scripts": {  
    "test": "echo \\\"Error: no test specified\\\" && exit 1"  
  },  
  "keywords": [],  
  "license": "ISC",  
  "dependencies": {  
    "Faker": "0.7.2" ←  
  }  
}
```

npm install
zip -r gifs *

AWS Lambda

Dashboard BETA

Functions

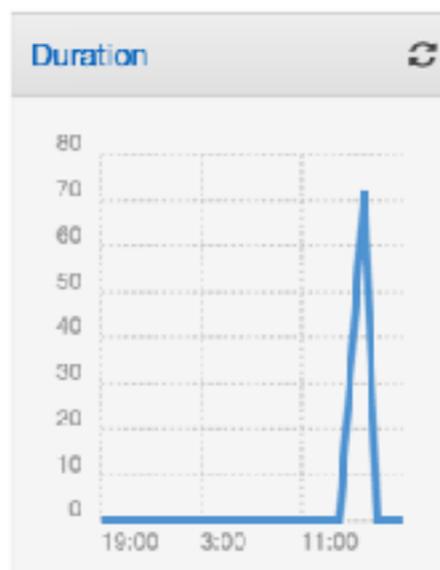
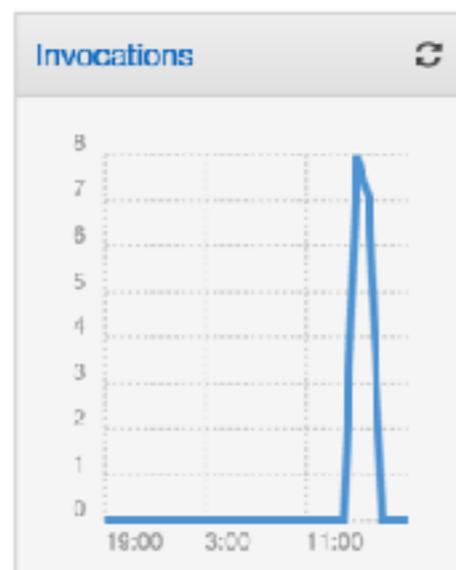
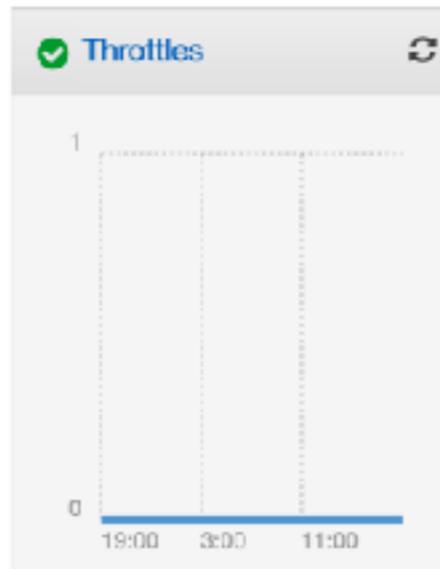
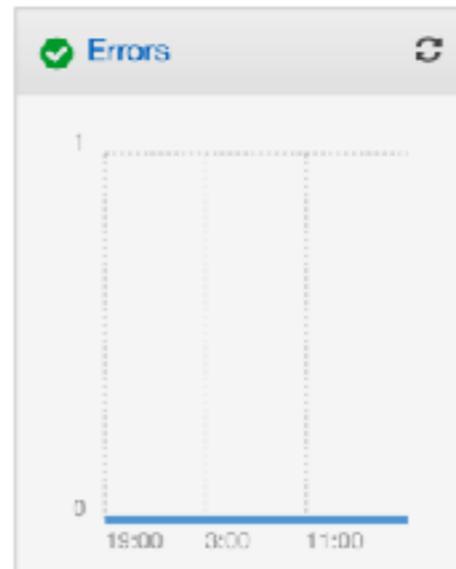
Resources for US West (N. California)

Lambda function(s) 1
Code storage 243 bytes

[Create a Lambda function](#)

Account-level metrics (last 24 hours)

The charts below show metrics across **all** your Lambda functions in this region. Click on the chart title to see a per-function breakdown, or click on the chart body to view the metrics in CloudWatch.



What's new

- Asia Pacific (Seoul) availability
- Asia Pacific (Singapore) availability
- Asia Pacific (Sydney) availability

Developer resources

- AWS Mobile SDK
- AWS Toolkit for Eclipse
- Jenkins plugin

Additional information

- [FAQ](#)
- [Release notes](#)
- [Developer guide](#)
- [Forums](#)
- [AWS Compute Blog](#)
- [Report an issue](#)

Lambda > New function

[Select blueprint](#)[Configure triggers](#)[Configure function](#)[Review](#)

Select blueprint



Blueprints are sample configurations of event sources and Lambda functions. Choose a blueprint that best aligns with your desired scenario and customize as needed, or skip this step if you want to author a Lambda function and configure an event source separately. Except where otherwise noted, blueprints are licensed under CC0.

[Select runtime](#)[Filter](#)

< < Viewing 1-9 of 69 > >

Blank Function

Configure your function from scratch. Define the trigger and deploy your code by stepping through our wizard.

[custom](#)

kinesis-firehose-syslog-to-json

An Amazon Kinesis Firehose stream processor that converts input records from RFC3164 Syslog format to JSON.

[nodejs · kinesis-firehose](#)

alexa-skill-kit-sdk-factskill

Demonstrate a basic fact skill built with the ASK NodeJS SDK

[nodejs · alexa](#)

kinesis-firehose-apachelog-to...

An Amazon Kinesis Firehose stream processor that converts input records from Apache Common Log format to

[python2.7 · kinesis-firehose](#)

cloudfront-modify-response-h...

Blueprint for modifying CloudFront response header implemented in NodeJS.

[nodejs · cloudfront · response header](#)

s3-get-object-python

An Amazon S3 trigger that retrieves metadata for the object that has been updated.

[python2.7 · s3](#)

config-rule-change-triggered

An AWS Config rule that is triggered by configuration changes to EC2 instances. Checks instance types.

[nodejs4.3 · config](#)

dynamodb-process-stream

An Amazon DynamoDB trigger that logs the updates made to a table.

[nodejs · dynamodb](#)

microservice-http-endpoint

A simple backend (read/write to DynamoDB) with a RESTful API endpoint using Amazon API Gateway.

[nodejs · api-gateway](#)[Cancel](#)

Lambda > New function

[Select blueprint](#)**Configure triggers**[Configure function](#)[Review](#)

Configure triggers

You can choose to add a trigger that will invoke your function.

[Remove](#)[Cancel](#)[Previous](#)[Next](#)

Lambda > New function

[Select blueprint](#)[Configure triggers](#)**Configure function**[Review](#)

Configure function

A Lambda function consists of the custom code you want to execute. [Learn more](#) about Lambda functions.

Name* cmjGetGifs

Description

Runtime* Node.js 4.3

Lambda function code

Provide the code for your function. Use the editor if your code does not require custom libraries (other than the aws-sdk). If you need custom libraries, you can upload your code and libraries as a ZIP file. [Learn more](#) about deploying Lambda functions.

Code entry type Upload a ZIP file

Function package* gifz.zip

For files larger than 10 MB, consider uploading via S3.

You can define Environment Variables as key-value pairs that are accessible from your function code. These are useful to store configuration settings without the need to change function code. [Learn more](#). For storing sensitive information, we recommend encrypting values using KMS and the console's encryption helpers.

Enable encryption helpers

Environment variables

Lambda function handler and role

Handler* index.handler

Role* Choose an existing role

Environment variables

Key

Value

X

Lambda function handler and role

Handler* index.handler



Role* Choose an existing role



Existing role* lambda_execute_role



Advanced settings

Memory (MB)* 128



Timeout* 0 min 3 sec

AWS Lambda will automatically retry failed executions for asynchronous invocations. You can additionally optionally configure Lambda to forward payloads that were not processed to a dead-letter queue (DLQ), such as an SQS queue or an SNS topic. Learn more about Lambda's [retry policy](#) and [DLQs](#). Please ensure your role has appropriate permissions to access the DLQ resource.

DLQ Resource

Select resource



All AWS Lambda functions run securely inside a default system-managed VPC. However, you can optionally configure Lambda to access resources, such as databases, within your custom VPC. Learn more about accessing VPCs within Lambda. Please ensure your role has appropriate permissions to configure VPC.

VPC

No VPC



Environment variables are encrypted at rest using a default Lambda service key. You can change the key below to one of your account's keys or paste in a full KMS key ARN.

KMS key

(default) aws/lambda



* These fields are required.

Cancel

Previous

Next



You can define Environment Variables as key-value pairs that are accessible from your function code. These are useful to store configuration settings without the need to change function code. [Learn more](#). For storing sensitive information, we recommend encrypting values using KMS and the console's encryption helpers.

Enable encryption helpers

Environment variables Key Value

Lambda function handler and role

Handler* index.handler

Role*

Existing role* lambda_execute_role

Advanced settings

These settings allow you to control the code execution performance and costs for your Lambda function. Changing your resource settings (by selecting memory) or changing the timeout may [impact your function cost](#). [Learn more](#) about how Lambda pricing works.

Memory (MB)* 128

Timeout* 0 min 3 sec

AWS Lambda will automatically retry failed executions for asynchronous invocations. You can additionally optionally configure Lambda to forward payloads that were not processed to a dead-letter queue (DLQ), such as an SQS queue or an SNS topic. Learn more about Lambda's [retry policy](#) and [DLQs](#). Please ensure your role has appropriate permissions to access the DLQ resource.

DLQ Resource

All AWS Lambda functions run securely [inside a default system-managed VPC](#). However, you can optionally configure Lambda to access resources, such as databases, within your custom VPC. [Learn more](#) about accessing VPCs within Lambda. Please ensure your role has appropriate permissions to [configure VPC](#).

VPC

Environment variables are encrypted at rest using a [default Lambda service key](#). You can change the key below to one of your account's keys or paste in a full KMS key ARN.

KMS key

* These fields are required.

[Cancel](#)

[Previous](#)

[Next](#)

index.js

```
'use strict';

var faker = require('Faker')

exports.handler = (event, context, callback) {
  var gifs = [];
  for(var i = 0; i < 10; i++) {

    var gif = {};
    gif.id = faker.random.number(100)
    gif.title = faker.Lorem.sentences
    gif.url = faker.Image.imageUrl(100, 100)

    gifs.push(gif);
  }

  callback(null, gifs);
}
```

Lambda > New function

[Select blueprint](#)[Configure triggers](#)[Configure function](#)[Review](#)

Review

Please review your Lambda function details. You can go back to edit changes for each section. When you are ready, click Create function to complete the setup process.

Lambda function

[Edit](#)

Name cmjGetGifs

Description

Runtime Node.js 4.3

Environment variables

Handler index.handler

Existing role* lambda_execute_role

DLQ Resource

Memory (MB) 128

Timeout 3

VPC No VPC

KMS key (default) aws/lambda

[Cancel](#)[Previous](#)[Create function](#)

AWS Lambda

Lambda > Functions > cmjGetGifs

ARN - arn:aws:lambda:us-west-1:563700736850:function:cmjGetGifs

Dashboard

Functions

Qualifiers ▾ Test Actions ▾

Congratulations! Your Lambda function 'cmjGetGifs' has been successfully created. You can now click on the 'Test' button to input a test event and test your function.

This function contains external libraries. Uploading a new file will override these libraries.

Code

Configuration

Triggers

Monitoring

?

Code entry type [Edit code inline](#)

```
1 'use strict';
2
3 var faker = require('faker')
4
5 exports.handler = (event, context, callback) => {
6     var gifs = [];
7     for(var i = 0; i < 10; i++) {
8
9         var gif = {};
10        gif.id = faker.random.number(100);
11        gif.title = fakerLorem.sentences(1);
12        gif.url = fakerImage.imageUrl(100, 100, 'sports') + "?" + faker.random.number(200)
13
14        gifs.push(gif);
15    }
16
17    callback(null, gifs);
18 }
```

I



You can define Environment Variables as key-value pairs that are accessible from your function code. These are useful to store configuration settings without the need to change function code. [Learn more](#). For storing sensitive information, we recommend encrypting values using KMS and the console's encryption helpers.

Enable encryption helpers

AWS Lambda

Lambda > Functions > cmjGetGifs

ARN - arn:aws:lambda:us-west-1:563700736850:function:cmjGetGifs

Dashboard

Functions

Qualifiers ▾ Test Actions ▾

Code Configuration Triggers Monitoring ?

Code entry type Edit code inline ▾

```
1 'use strict';
2
3 var faker = require('Faker')
4
5 exports.handler = (event, context, callback) => {
6     var gifs = [];
7     for(var i = 0; i < 10; i++) {
8
9         var gif = {};
10        gif.id = faker.random.number(100);
11        gif.title = faker.Lorem.sentences(1);
12        gif.url = faker.Image.imageUrl(100, 100, 'sports') + "?" + faker.random.number(200)
13
14        gifs.push(gif);
15    }
16}
```

Execution result: succeeded (logs)

The area below shows the result returned by your function execution. Learn more about returning results from your function.

```
[{"id": 12, "title": "itaque reiciendis temporibus alias illo", "url": "http://lorempixel.com/100/100/sports?104"}, {"id": 5, "title": "porro eos ut necessitatibus tenetur", "url": "http://lorempixel.com/100/100/sports?136"}]
```



Summary

Code 3IFcYuTcaa4Rv8CmGWDB

SHA-256 GX0V7msUAwolq9KRnR9C

Ww=

Request a65764fe-d7b0-11e6-aa2e-

ID f13893d30969

Log output

The area below shows the logging calls in your code. These correspond to a single row within the CloudWatch log group corresponding to this Lambda function. Click here to view the CloudWatch log group.

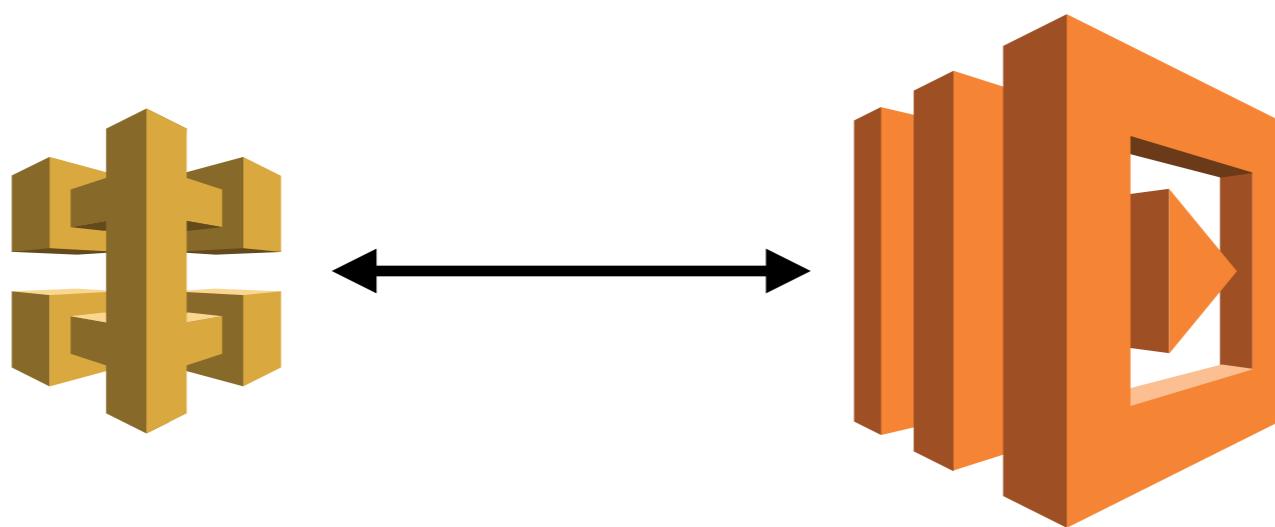
START RequestId: a65764fe-d7b0-11e6-aa2e-f13893d30989 Version: \$LATEST

END RequestId: a65764fe-d7b0-11e6-aa2e-f13893d30989

```
aws lambda create-function \
--profile aws-pres \
--function-name cmjGetGifs \
--zip-file fileb://gifs.zip \
--role arn:aws:iam::563700736850:role/lambda_execute_role \
--handler index.handler \
--runtime nodejs4.3 \
--timeout 15 \
--memory-size 128
```

```
aws lambda update-function-code \  
  --function-name cmjGetGifs \  
  --zip-file fileb://gifs.zip \  
  --profile aws-pres
```

GATEWAY API



- Create API
- Create Resource
- Create Method



Amazon API Gateway

Amazon API Gateway helps developers to create and manage APIs to back-end systems running on Amazon EC2, AWS Lambda, or any publicly addressable web service. With Amazon API Gateway, you can generate custom client SDKs for your APIs, to connect your back-end systems to mobile, web, and server applications or services.

[Get Started](#)[Getting Started Guide](#)

Streamline API development
Amazon API Gateway lets you simultaneously run multiple versions and release stages of the same API, allowing you to quickly iterate, test, and release new versions.

[Learn More](#)

Performance at scale
Amazon API Gateway helps you improve performance by managing traffic to your existing back-end systems, throttling API call spikes, and enabling result caching.

[Learn More](#)

SDK generation

Amazon API Gateway can generate client SDKs for JavaScript, iOS, and Android, which you can use to quickly test new APIs from your applications and distribute SDKs to third-party developers.

[Learn More](#)

API Gateway documentation and support

[Getting started guide](#) | [API Gateway documentation](#) | [Forums](#)

Create new API

In Amazon API Gateway, an API refers to a collection of resources and methods that can be invoked through HTTPS endpoints.

- New API Import from Swagger Example API

Name and description

Choose a friendly name and description for your API.

API name*

cm|GifTube



Description

Gif Tube



* Required

Create API



APIs

Resources

Actions

/ Methods

cmjGifTube

Resources

Stages

Authorizers

Models

Documentation

Binary Support

Usage Plans

API Keys

Custom Domain Names

Client Certificates

Settings

No methods defined for the resource.

/



APIs

cmjGifTube

Resources

Stages

Authorizers

Models

Documentation

Binary Support

Usage Plans

API Keys

Custom Domain Names

Client Certificates

Settings

Resources

Actions

/ Methods

RESOURCE ACTIONS

- Create Method
- Create Resource**
- Enable CORS
- Edit Resource Documentation

API ACTIONS

- Deploy API
- Import API
- Edit API Documentation
- Delete API

No methods defined for the resource.



Services | Resource Groups | cjudd @ 5637-0073-6850 | N. California | Support

Amazon API Gateway APIs > cmjGiTube (6ry0hpz9vk) > Resources > / (h1r|bq7ref) > Create Show all hints ?

Resources Actions - New Child Resource

Use this page to create a new child resource for your resource.

Configure as proxy resource

Resource Name* gifs 

Resource Path* / gifs

You can add path parameters using brackets. For example, the resource path {username} represents a path parameter called 'username'. Configuring /{proxy+} as a proxy resource catches all requests to its sub-resources. For example, it works for a GET request to /foo. To handle requests to /, add a new ANY method on the / resource.

Enable API Gateway CORS

* Required

Cancel  Create Resource

Resources

Actions

/gifs Methods

RESOURCE ACTIONS

- [Create Method](#)
- [Create Resource](#)
- [Enable CORS](#)
- [Edit Resource Documentation](#)
- [Delete Resource](#)

API ACTIONS

- [Deploy API](#)
- [Import API](#)
- [Edit API Documentation](#)
- [Delete API](#)

No methods defined for the resource.



Resources

Actions -

/gifs Methods

No methods defined for the resource.



Resources

Actions

/gifs - GET - Setup



Choose the integration point for your new method.

- /
- /gifs
 - GET

Integration type Lambda Function HTTP Mock AWS Service Use Lambda Proxy integration

Lambda Region

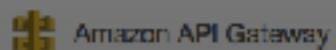
us-west-1



Lambda Function cmjGetGifs



Save



Amazon API Gateway

Resources

Actions

/

/gifs

GET

Add Permission to Lambda Function

X

Show all hints



You are about to give API Gateway permission to invoke your Lambda function:

arn:aws:lambda:us-west-1:563700736850:function:cmjGetGifs

Cancel

OK



○ JSON

○ AWS Service

Use Lambda Proxy integration

Lambda Region

us-west-1

Lambda Function cmjGetGifs

Save



Resources

Actions

/gifs - GET - Method Execution

/

/gifs

GET

TEST



Method Request

Auth: NONE

ARN: arn:aws:execute-api:us-west-1:663700736850:6ry0hpz9vk/*/GIFs

Integration Request

Type: LAMBDA

Region: us-west-1

Client

Method Response

HTTP Status: 200

Models: application/json => Empty

Integration Response

HTTP status pattern: -

Output passthrough: Yes

Lambda cmjGetGifs

Services | Resource Groups | cjudd @ 5637-0073-6850 | N. California | Support

Amazon API Gateway APIs > cmjGiTube (8ry0hpz9vk) > Resources > /gifs (ma11u8) > GET Show all hints ?

Resources Actions - Method Execution /gifs - GET - Method Test

Make a test call to your method with the provided input

Path

No path parameters exist for this resource. You can define path parameters by using the syntax `{myPathParam}` in a resource path.

Query Strings

No query string parameters exist for this method. You can add them via Method Request.

Headers

No header parameters exist for this method. You can add them via Method Request.

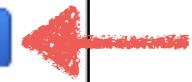
Stage Variables

No stage variables exist for this method.

Request Body

Request Body is not supported for GET methods.

Test



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Resources

Actions

Test

/

/gifs

GET

Request: /gifs

Status: 200

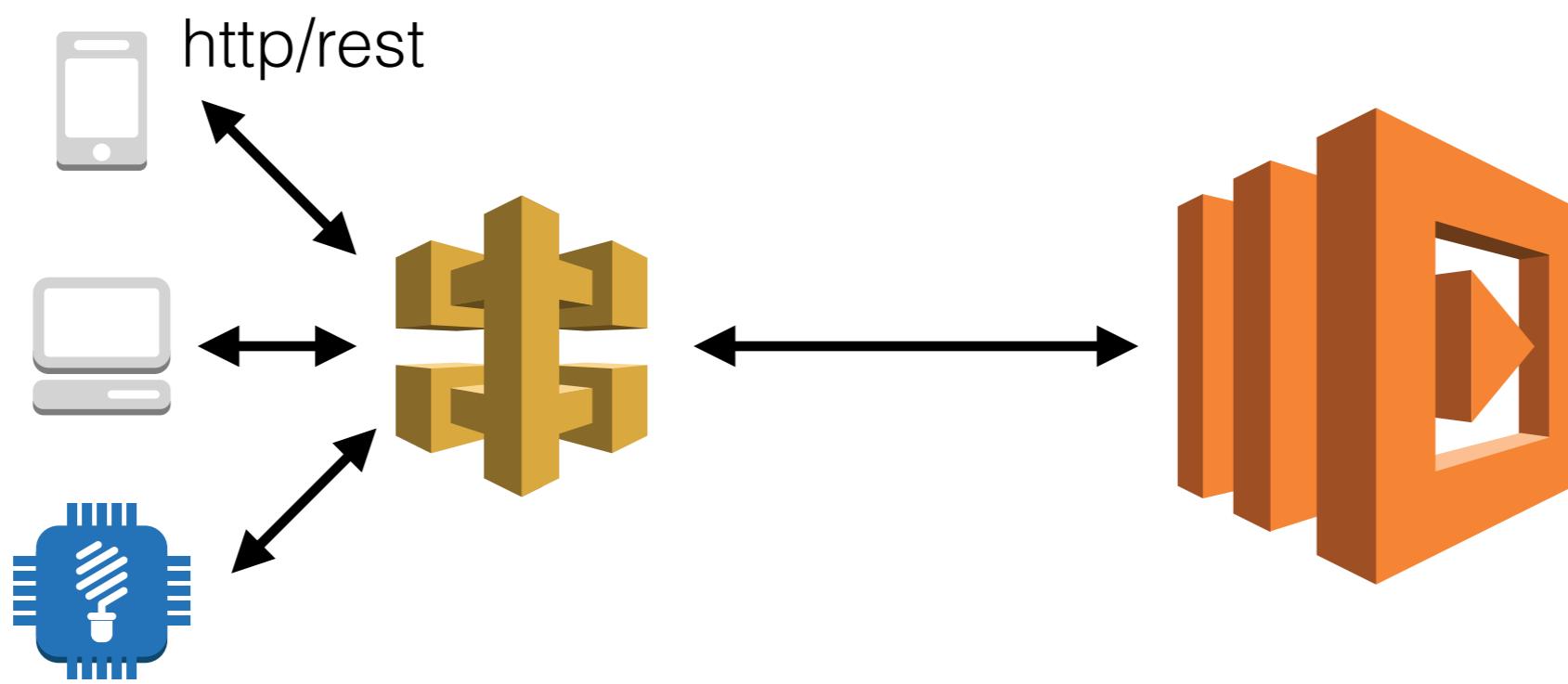
Latency: 170 ms

Response Body

```
[  
  [  
    {  
      "id": 49,  
      "title": "perferendis dolorem dolores sit corporis aliquam maiores",  
      "url": "http://lorempixel.com/100/100/sports?90"  
    },  
    {  
      "id": 15,  
      "title": "qui sed exercitationem magni voluptatem deleniti laborum",  
      "url": "http://lorempixel.com/100/100/sports?50"  
    },  
    {  
      "id": 78,  
      "title": "aut tempora assumenda id quis vitae cunque",  
      "url": "http://lorempixel.com/100/100/sports?80"  
    },  
    {  
      "id": 30,  
      "title": "sit aliquid officia accusantium delectus voluptate consequuntur",  
      "url": "http://lorempixel.com/100/100/sports?150"  
    },  
    {  
      "id": 26,  
      "title": "ut ea aut officia molestiae omnis accusamus in corrupti",  
      "url": "http://lorempixel.com/100/100/sports?117"  
    },  
    {  
      "id": 58,  
      "title": "voluptatem eos perspiciatis eveniet necessitatibus quis facilis aut",  
      "url": "http://lorempixel.com/100/100/sports?50"  
    },  
    {  
      "id": 25,  
      "title": "ut occaecati debitis porro incident velit",  
      "url": "http://lorempixel.com/100/100/sports?90"  
    },  
    {  
      "id": 24,  
      "title": "et aut et maiores laudentium cum magni",  
      "url": "http://lorempixel.com/100/100/sports?13"  
    },  
    {  
      "id": 12,  
      "title": "tempore ut est et quod",  
      "url": "http://lorempixel.com/100/100/sports?100"  
    }]
```



DEPLOY API



Resources

Actions / Methods

- /
- /gifs
- GET

- RESOURCE ACTIONS
 - Create Method
 - Create Resource
 - Enable CORS
 - Edit Resource Documentation

- API ACTIONS
 - Deploy API**
 - Import API
 - Edit API Documentation
 - Delete API

No methods defined for the resource.

 Amazon API Gateway

Resources Actions ▾

▼ /

/gits

GET

Deploy API 

Show all hints



Choose a stage where your API will be deployed. For example, a test version of your API could be deployed to a stage named beta.

Deployment stage

[New Stage]



Stage name

cmjDew

Stage description

Chris Judd's DevStage

Deployment description

development environment

Cancel

Deploy



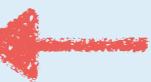
Stages

Create

▶ cmjDev

Delete Stage

cmjDev Stage Editor

● Invoke URL: <https://6ry0hpz9vk.execute-api.us-west-1.amazonaws.com/cmjDev>

Settings

Stage Variables

SDK Generation

Export

Deployment History

Documentation History

Configure the metering and caching settings for the cmjDev stage.

Cache Settings

Enable API cache

CloudWatch Settings

Enable CloudWatch Logs ⓘEnable Detailed CloudWatch Metrics ⓘ

Default Method Throttling

Choose the default throttling level for the methods in this stage. Each method in this stage will respect these rate and burst settings. Your current account level throttling rate is 1000 requests per second with a burst of 2000 requests. ⓘ

Enable throttling ⓘ

Rate 1000 requests per second

Burst 2000 requests

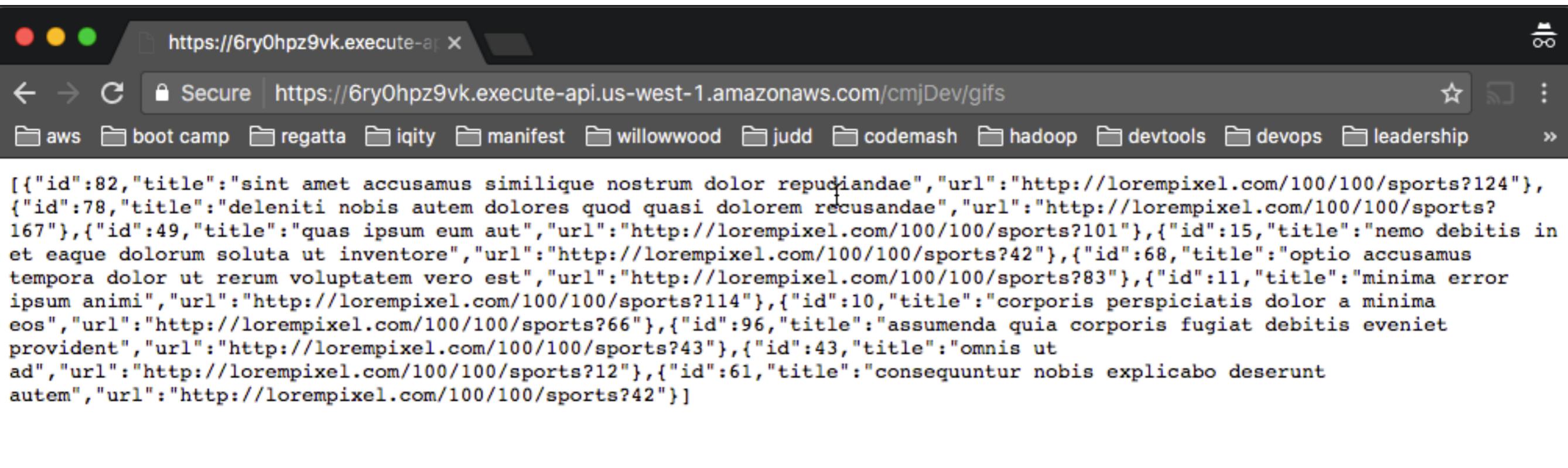
Client Certificate

Select the client certificate that API Gateway will use to call your integration endpoints in this stage. ↗

Certificate None

Save Changes





A screenshot of a web browser window. The address bar shows a secure connection to `https://6ry0hpz9vk.execute-api.us-west-1.amazonaws.com/cmjDev/gifs`. Below the address bar is a navigation bar with links to various AWS services like aws, boot camp, regatta, iqity, manifest, willowwood, judd, codemash, hadoop, devtools, devops, and leadership. The main content area displays a JSON array of objects, each representing a GIF with an ID, title, and URL:

```
[{"id":82,"title":"sint amet accusamus similique nostrum dolor repudiandae","url":"http://lorempixel.com/100/100/sports?124"}, {"id":78,"title":"deleniti nobis autem dolores quod quasi dolorem recusandae","url":"http://lorempixel.com/100/100/sports?167"}, {"id":49,"title":"quas ipsum eum aut","url":"http://lorempixel.com/100/100/sports?101"}, {"id":15,"title":"nemo debit is in et eaque dolorum soluta ut inventore","url":"http://lorempixel.com/100/100/sports?42"}, {"id":68,"title":"optio accusamus tempora dolor ut rerum voluptatem vero est","url":"http://lorempixel.com/100/100/sports?83"}, {"id":11,"title":"minima error ipsum animi","url":"http://lorempixel.com/100/100/sports?114"}, {"id":10,"title":"corporis perspiciatis dolor a minima eos","url":"http://lorempixel.com/100/100/sports?66"}, {"id":96,"title":"assumenda quia corporis fugiat debit is eveniet provident","url":"http://lorempixel.com/100/100/sports?43"}, {"id":43,"title":"omnis ut ad","url":"http://lorempixel.com/100/100/sports?12"}, {"id":61,"title":"consequuntur nobis explicabo deserunt autem","url":"http://lorempixel.com/100/100/sports?42"}]
```



`https://6ry0hpz9vk.execute-api.us-west-1.amazonaws.com/cmjDev/gifs`

Runner Import +

Builder Team Library

SYNC OFF Sign In

local (reactor)

Filter History Collections

All Me Team

14714 - multi post 1 request

API V2.0 16 requests

API v3.0 0 requests

Postman Echo 20 requests

reactor 3 requests

SIF 6 requests

https://5ry0hpz9vkex GET https://5ry0hpz9vke.execute-api.us-west-1.amazonaws.com/cmjBew/gifs

Auth Headers (2) Body Pre-request Script Tests

Type: No Auth

Body Cookies Headers (6) Tests

Pretty Raw Preview JSON

Status: 200 OK Time: 377 ms

```
1- []
2- {
3-   "id": 70,
4-   "title": "nulla possimus illo qui commodi labore",
5-   "url": "http://lorempixel.com/100/100/sports?125"
6- },
7- {
8-   "id": 80,
9-   "title": "et culpa similique eligendi ex deserunt beatae enim",
10-  "url": "http://lorempixel.com/100/100/sports?117"
11- },
12- {
13-   "id": 72,
14-   "title": "iste fugit sapiente est dignissimos",
15-   "url": "http://lorempixel.com/100/100/sports?187"
16- },
17- {
18-   "id": 89,
19-   "title": "incidunt quos provident aut perferendis id officia",
20-   "url": "http://lorempixel.com/100/100/sports?80"
21- },
22- {
23-   "id": 43,
24-   "title": "perspiciatis est rerum sit nemo provident corrupti enim autem",
25-   "url": "http://lorempixel.com/100/100/sports?175"
26- },
27- {
28-   "id": 67,
29-   "title": "quia atque iusto corrupti aperiam",
30-   "url": "http://lorempixel.com/100/100/sports?78"
31- },
32- {
33-   "id": 54,
```

```
curl -X GET \
"https://6ry0hpz9vk.execute-api.us-west-1.amazonaws.com/cmjDev/gifs"
```

```
[  
  {  
    "id": 59,  
    "title": "porro aperiam quae et incidunt",  
    "url": "http://lorempixel.com/100/100/sports?24"  
  },  
  {  
    "id": 86,  
    "title": "neque officiis aut consequatur rerum modi hic explicabo qui",  
    "url": "http://lorempixel.com/100/100/sports?68"  
  },  
  {  
    "id": 34,  
    "title": "nihil ut sed",  
    "url": "http://lorempixel.com/100/100/sports?59"  
  },  
  {  
    "id": 81,  
    "title": "ipsam dicta molestiae aut temporibus magni",  
    "url": "http://lorempixel.com/100/100/sports?102"  
  },  
  {  
    "id": 26,  
    "title": "porro non commodi et praesentium est eligendi et",  
    "url": "http://lorempixel.com/100/100/sports?166"  
  },  
  {  
    "id": 18,  
    "title": "impedit est doloremque nesciunt nemo",  
    "url": "http://lorempixel.com/100/100/sports?104"  
  }  
]
```

DYNAMO DB

DynamoDB[Dashboard](#)
[Tables](#)
[Reserved capacity](#)**Create table**

Amazon DynamoDB is a fully managed non-relational database service that provides fast and predictable performance with seamless scalability.

[Create table](#)**Recent alerts**

No CloudWatch alarms have been triggered.

[View all in CloudWatch](#)**Total capacity for US West (N. California)**

Provisioned read capacity	5
Provisioned write capacity	5
Reserved read capacity	0
Reserved write capacity	0

Service health

Current Status	Details
Amazon DynamoDB (N. California)	Service is operating normally View complete service health details

Best practices

Amazon DynamoDB Day...

How to Design NoSQL Tables and Avoid Hot Keys

Excerpt from:
DynamoDB Day
January 20, 2016

What's new

- Enhanced metrics
- Titan graph database integration
- Elasticsearch integration

Related services

- Amazon ElastiCache

Additional resources

- Getting started guide
- FAQ
- Developer guide
- Report an issue
- Getting started hands-on lab
- Release notes
- Forums

Create DynamoDB table

[Tutorial](#)

DynamoDB is a schema-less database that only requires a table name and primary key. The table's primary key is made up of one or two attributes that uniquely identify items, partition the data, and sort data within each partition.

Table name* 



Primary key* Partition key

 (String) 

Add sort key

Table settings

Default settings provide the fastest way to get started with your table. You can modify these default settings now or after your table has been created.

Use default settings

- No secondary indexes.
- Provisioned capacity set to 5 reads and 5 writes.
- Basic alarms with 80% upper threshold using SNS topic "dynamodb".

Additional charges may apply if you exceed the AWS Free Tier levels for CloudWatch or Simple Notification Service. Advanced alarm settings are available in the CloudWatch management console.

[Cancel](#)

[Create](#) 

DynamoDB

Dashboard

Tables

Reserved capacity

[Create table](#)[Actions](#) ▾ Filter by table name X

Name

cmjGiftsTable

cmjGiftsTable [Close](#)[Overview](#)[Items](#)[Metrics](#)[Alarms](#)[Capacity](#)[More](#) ▾

Recent alerts

No CloudWatch alarms have been triggered for this table.

Stream details

Stream enabled NoView type -Latest stream ARN -[Manage Stream](#)

Table details

Table name	cmjGiftsTable
Primary partition key	key (String)
Primary sort key	-
Table status	Active
Creation date	January 11, 2017 at 8:00:00 UTC-5
Provisioned read capacity units	5
Provisioned write capacity units	5
Last decrease time	-
Last increase time	-
Storage size (in bytes)	0 bytes
Item count	0
Region	US West (N. California)
Amazon Resource Name (ARN)	arn:aws:dynamodb:us-west-2:563700736850:table/cmjGiftsTable

Storage size and item count are not updated in real-time. They are updated periodically, roughly every six hours.

```
'use strict';

const aws = require('aws-sdk');
const s3 = new aws.S3({ apiVersion: '2006-03-01' });
var dynamodb = new aws.DynamoDB({apiVersion: '2012-08-10'});

exports.handler = (event, context, callback) => {

    const region = event.Records[0].awsRegion;
    const bucket = event.Records[0].s3.bucket.name;
    const key = decodeURIComponent(event.Records[0].s3.object.key.replace(/\+/g, ' '));
    const params = {
        Bucket: bucket,
        Key: key,
    };
    s3.getObject(params, (err, data) => {
        if (err) {
            console.log(err);
            const message = `Error getting object ${key} from bucket ${bucket}.`;
            console.log(message);
            callback(message);
        } else {
            var url = `https://s3-${region}.amazonaws.com/${bucket}/${key}`;

            var datetime = new Date().getTime().toString();
            var userid = data.Metadata.user_id || "none";

            dynamodb.putItem({
                "TableName": "<TABLE NAME>",
                "Item" : {
                    "key": {"S": key },
                    "date": {"S": datetime },
                    "url": {"S": url },
                    "user_id": {"S": userid }
                }
            }, function(err, data) {
                if (err) {
                    console.log('error', err)
                }
            });
        }
    });
}
```

```
cd giftube-lambda
cd gifProcessor
vim index.js
```

```

const region = event.Records[0].awsRegion;
const bucket = event.Records[0].s3.bucket.name;
const key = decodeURIComponent(event.Records[0].s3.object.key.replace(/\+/g, ' '));
const params = {
  Bucket: bucket,
  Key: key,
};

s3.getObject(params, (err, data) => {
  if (err) {
    console.log(err);
    const message = `Error getting object ${key} from bucket ${bucket}.`;
    console.log(message);
    callback(message);
  } else {
    var url = `https://s3-${region}.amazonaws.com/${bucket}/${key}`;

    var datetime = new Date().getTime().toString();
    var userid = data.Metadata.user_id || "none";

    dynamodb.putItem({
      "TableName": "<TABLE NAME>",
      "Item" : {
        "key": {"S": key},
        "date": {"S": datetime},
        "url": {"S": url},
        "user_id": {"S": userid}
      }
    }, function(err, data) {
      if (err) {
        console.log('error', err)
        callback('Unable to put ' + key + ' item into dynamodb failed: ' + err);
      } else {
        console.log('Put : '+JSON.stringify(data, null, ' '));
        callback(null, 'Put ' + key);
      }
    });
  }
});
}

```

```

cd giftube-lambda
cd gifProcessor
vim index.js

```

vim package.json

```
{  
  "name": "gifProcessor",  
  "version": "1.0.0",  
  "description": "Gif Processor Lambda",  
  "repository": {  
    "type": "git",  
    "url": "https://github.com/cjudd/giftube-lambda"  
  },  
  "main": "index.js", ←  
  "scripts": {  
    "test": "echo \\\"Error: no test specified\\\" && exit 1"  
  },  
  "keywords": [],  
  "license": "ISC",  
  "dependencies": {  
    "aws-sdk": "^2.7.21" ←  
  }  
}
```

npm install
zip -r processor *

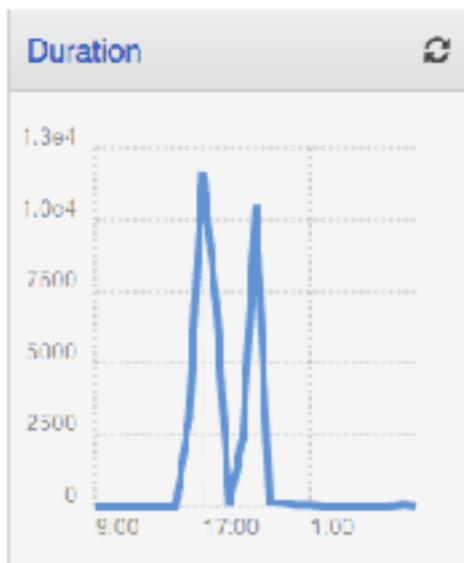
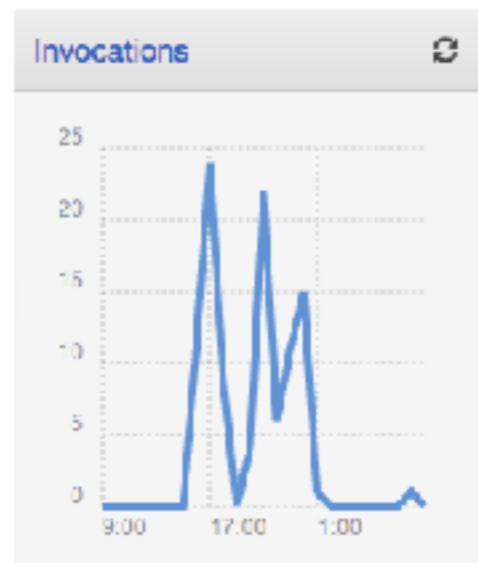
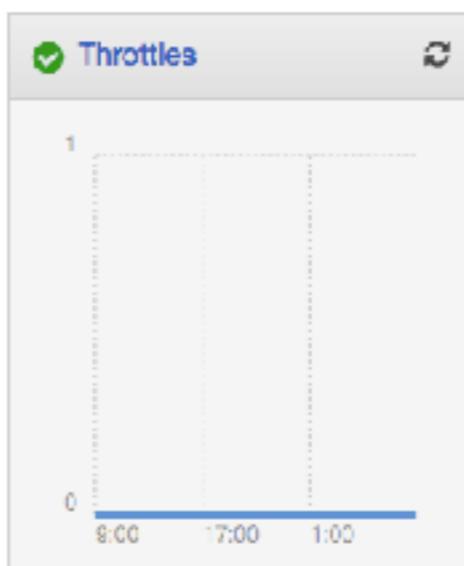
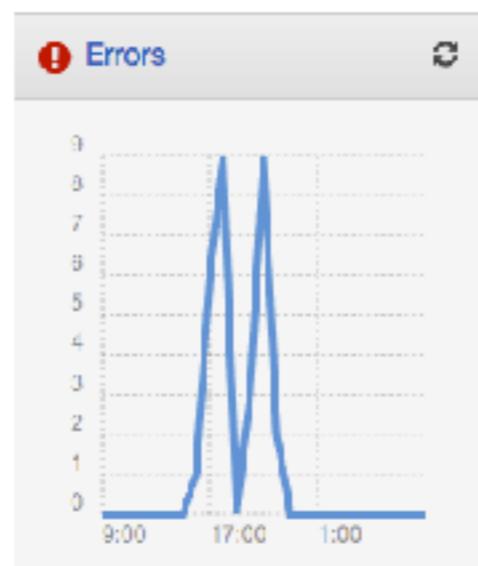
AWS Lambda**Dashboard****Functions****Resources for US West (N. California)**

Lambda function(s) 9

Code storage 3.7 MB

[Create a Lambda function](#)**Account-level metrics (last 24 hours)**

The charts below show metrics across all your Lambda functions in this region. Click on the chart title to see a per-function breakdown, or click on the chart body to view the metrics in CloudWatch.

**What's new**

- AWS Lambda supports C/C++
- AWS Greengrass, now in limited preview
- Amazon Lex, now in preview

Developer resources

- AWS Mobile SDK
- AWS Toolkit for Eclipse
- Jenkins plugin
- AWS Serverless Application Model

Additional Information

- [FAQ](#)
- [Release notes](#)
- [Developer guide](#)
- [Forums](#)
- [AWS Compute Blog](#)
- [Report an issue](#)

Lambda > New function

Select blueprint

Configure triggers

Configure function

Review

Select blueprint



Blueprints are sample configurations of event sources and Lambda functions. Choose a blueprint that best aligns with your desired scenario and customize as needed, or skip this step if you want to author a Lambda function and configure an event source separately. Except where otherwise noted, blueprints are licensed under CC0.

Select runtime

Filter

< Viewing 1-9 of 69 >

Blank Function

Configure your function from scratch.
Define the trigger and deploy your code
by stepping through our wizard.

custom

kinesis-firehose-syslog-to-json

An Amazon Kinesis Firehose stream
processor that converts input records
from RFC3164 Syslog format to JSON.

nodejs · kinesis-firehose

alexa-skill-kit-sdk-factskill

Demonstrate a basic fact skill built with
the ASK NodeJS SDK

nodejs · alexa

kinesis-firehose-apachelog-to...

An Amazon Kinesis Firehose stream
processor that converts input records
from Apache Common Log format to

python2.7 · kinesis-firehose

cloudfront-modify-response-h...

Blueprint for modifying CloudFront
response header implemented in
NodeJS.

nodejs · cloudfront · response header

s3-get-object-python

An Amazon S3 trigger that retrieves
metadata for the object that has been
updated.

python2.7 · s3

config-rule-change-triggered

An AWS Config rule that is triggered by
configuration changes to EC2 instances.
Checks instance types.

nodejs4.3 · config

dynamodb-process-stream

An Amazon DynamoDB trigger that logs
the updates made to a table.

nodejs · dynamodb

microservice-http-endpoint

A simple backend (read/write to
DynamoDB) with a RESTful API
endpoint using Amazon API Gateway.

nodejs · api-gateway

Cancel

Lambda > New function

Select blueprint

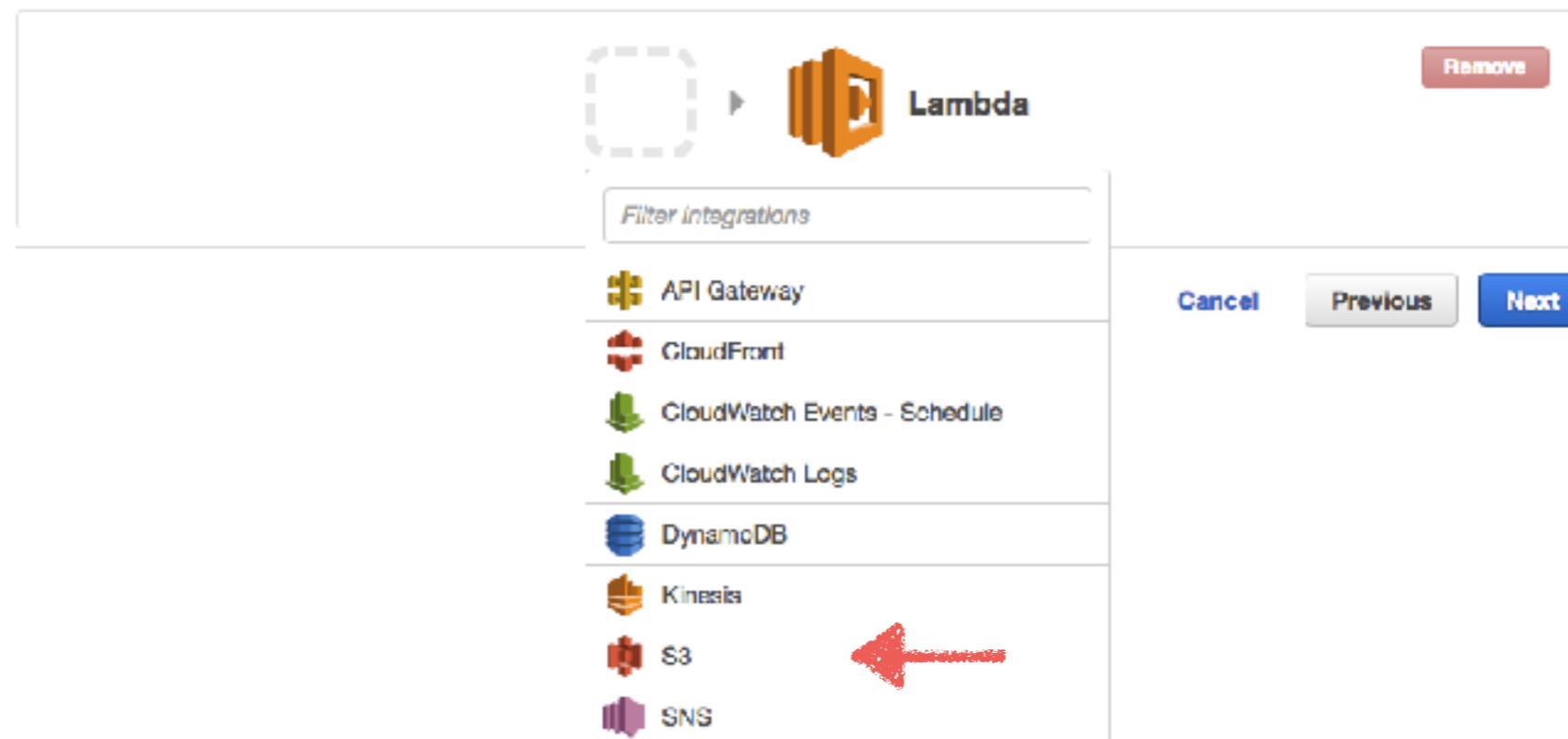
Configure triggers

Configure function

Review

Configure triggers

You can choose to add a trigger that will invoke your function.



Lambda > New function

Select blueprint

Configure triggers

Configure function

Review

Configure triggers

You can choose to add a trigger that will invoke your function.

[Remove](#)

Bucket cmj.giftube.git

Event type Put

Prefix e.g. images/

Suffix e.g. jpg



Lambda will add the necessary permissions for Amazon S3 to invoke your Lambda function from this bucket. [Learn more about the Lambda permissions model.](#)

Enable trigger [Cancel](#)[Previous](#)[Next](#)

[Lambda](#) > New function[Select blueprint](#)[Configure triggers](#)**Configure function**[Review](#)

Configure function

A Lambda function consists of the custom code you want to execute. [Learn more](#) about Lambda functions.

Name* Description Runtime*

Lambda function code

Provide the code for your function. Use the editor if your code does not require custom libraries (other than the aws-sdk). If you need custom libraries, you can upload your code and libraries as a ZIP file. [Learn more](#) about deploying Lambda functions.

Code entry type

[Edit code inline](#)

```
1 'use strict';
2
3 const aws = require('aws-sdk');
4 const s3 = new aws.S3({ apiVersion: '2006-03-01' });
5 var dynamodb = new aws.DynamoDB({apiVersion: '2012-08-10'});
6
7 exports.handler = (event, context, callback) => {
8
9     const region = event.Records[0].awsRegion;
10    const bucket = event.Records[0].s3.bucket.name;
11    const key = decodeURIComponent(event.Records[0].s3.object.key.replace(/\+/g, ' '));
12    const params = {
13        Bucket: bucket,
14        Key: key,
15    };
16    s3.getObject(params, (err, data) => {
17        if (err) {
18            console.log(err);
19            const message = `Error getting object ${key} from bucket ${bucket}.`;
20            console.log(message);
21            callback(message);
22        } else {
23            var url = `https://${region}.amazonaws.com/${bucket}/${key};`
```

Environment variables

Key

Value

X

Lambda function handler and role

Handler*

index.handler

i



Role*

Choose an existing role

i



Existing role*

lambda_execute_role

i



Advanced settings

These settings allow you to control the code execution performance and costs for your Lambda function. Changing your resource settings (by selecting memory) or changing the timeout may impact your function cost. [Learn more](#) about how Lambda pricing works.

Memory (MB)*

128

i

Timeout*

0

min

3

sec

i

AWS Lambda will automatically retry failed executions for asynchronous invocations. You can additionally optionally configure Lambda to forward payloads that were not processed to a dead-letter queue (DLQ), such as an SQS queue or an SNS topic. [Learn more](#) about Lambda's retry policy and DLQs. Please ensure your role has appropriate permissions to access the DLQ resource.

DLQ Resource

Select resource

i

All AWS Lambda functions run securely inside a default system-managed VPC. However, you can optionally configure Lambda to access resources, such as databases, within your custom VPC. [Learn more](#) about accessing VPCs within Lambda. Please ensure your role has appropriate permissions to configure VPC.

VPC

No VPC

i

Environment variables are encrypted at rest using a default Lambda service key. You can change the key below to one of your account's keys or paste in a full KMS key ARN.

KMS key

(default) aws/lambda

i

* These fields are required.

Cancel

Previous

Next

Lambda > New function

[Select blueprint](#)[Configure triggers](#)[Configure function](#)[Review](#)

Review

Please review your Lambda function details. You can go back to edit changes for each section. When you are ready, click **Create function** to complete the setup process.

Triggers

[Edit](#)

S3

Bucket: cmj.giftube.gifs Event type: ObjectCreatedByPut

Enabled

Lambda function

[Edit](#)

Name: cmjGifProcessor

Description

Runtime: Node.js 4.3

Environment variables

Handler: index.handler

Existing role*: lambda_execute_role

DLQ Resource

Memory (MB): 128

Timeout: 3

VPC: No VPC

KMS key: (default) aws/lambda

[Cancel](#)[Previous](#)[Create function](#)

AWS Lambda

Lambda > Functions > cmjGifProcessor

ARN - arn:aws:lambda:us-west-1:563700736850:function:cmjGifProcessor

Dashboard

Functions

Qualifiers

Test

Actions

Congratulations! Your Lambda function "cmjGifProcessor" has been successfully created and configured with S3: cmj.giftube.gifs as a trigger. You can now click on the "Test" button to input a test event and test your function.

Code

Configuration

Triggers

Monitoring



S3: cmj.giftube.gifs

arn:aws:s3:::cmj.giftube.gifs

Event type: ObjectCreated:Put

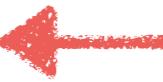
Disable

Delete

+ Add trigger

Giftube.tech

Choose file pokeman.gif



1. impedit aut et qui adipisci



2. est eos perro eveniet



3. quisquam praesentium temporibus doloribus



4. iusto incident cum



5. distinctio incident in voluptatum magnum



6. et ab dolorem



7. qui qui doloribus quis deserunt ex rem



8. dolore doloremque fuga ab



Create table Actions

Filter by table name

Name

cmjGifsTable

cmjGifsTable Close

Overview Items Metrics Alarms Capacity Indexes Access control

Create item Actions

Scan: [Table] cmjGifsTable: key ^ Viewing 1 to 2 items

Scan [Table] cmjGifsTable: key Add filter Start search

	key	date	url	user_id	
<input type="checkbox"/>	gifs/fish2.gif	14841439285...	https://s3-us-...	none	
<input type="checkbox"/>	gifs/pokeman.gi	14841439263...	https://s3-us-...	none	

Create cmjGifsTable Close

Edit item

Tree ▾

Item {4}

- + date String : 1484143926329
- + key String : gifs/pokeman.gif
- + url String : <https://s3-us-west-1.amazonaws.com/cmj.giftube.gifs/gifs/pokeman.gif>
- + user_id String : none

Cancel Save

```
'use strict';

const aws = require('aws-sdk');
const s3 = new aws.S3({ apiVersion: '2006-03-01' });
var dynamodb = new aws.DynamoDB({apiVersion: '2012-08-10'});

exports.handler = (event, context, callback) => {

    var params = {
        TableName: "<TABLE NAME>",
    }

    dynamodb.scan(params, (err, data) => {
        var gifs = [];

        data.Items.forEach((item) => {

            var gif = {};
            gif.id = item.key.S;
            gif.title = item.user_id.S + "—" + item.date.S;
            gif.url = item.url.S;

            gifs.push(gif);

        });

        callback(null, gifs);
    });
}
```

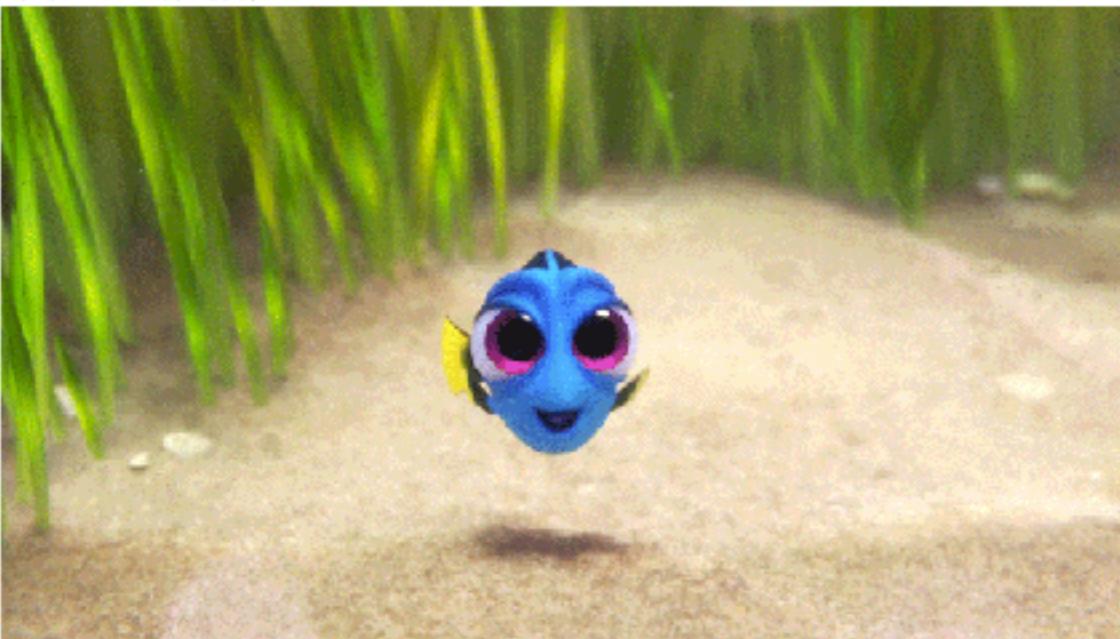
```
cd getGifs
zip -r gifs *
aws lambda update-function-code \
--function-name cmjGetGifs \
--zip-file fileb://gifs.zip \
--profile aws-pres
```

header works!

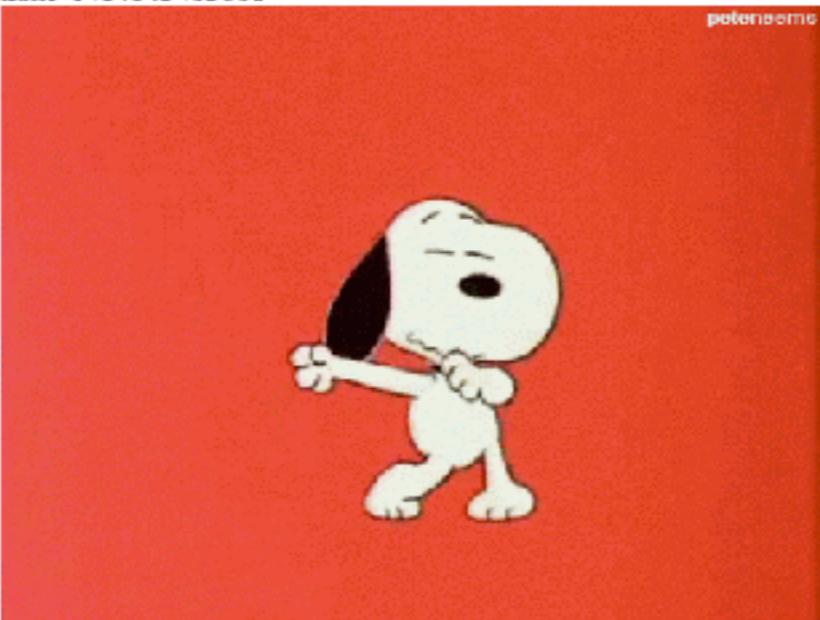
Giftube.tech

No file chosen

1. none-1484143928589



2. none-1484145405608



3. none-1484143926329



SUMMARY

Memory (MB)	Free tier seconds per month	Price per 100ms (\$)	832	492,308	0.000001354
128	3,200,000	0.000000208	896	457,143	0.000001459
192	2,133,333	0.000000313	960	426,667	0.000001563
256	1,600,000	0.000000417	1024	400,000	0.000001667
320	1,280,000	0.000000521	1088	376,471	0.000001771
384	1,066,667	0.000000625	1152	355,556	0.000001875
448	914,286	0.000000729	1216	336,842	0.000001980
512	800,000	0.000000834	1280	320,000	0.000002084
576	711,111	0.000000938	1344	304,762	0.000002188
640	640,000	0.000001042	1408	290,909	0.000002292
704	581,818	0.000001146	1472	278,261	0.000002396
768	533,333	0.000001250	1536	266,667	0.000002501

\$0.00001667 (1/60,000 th of a cent) for every GB/s used.
\$0.20 for every 1 million requests

Pros

- save money
- horizontal scaling
- focus on business not infrastructure

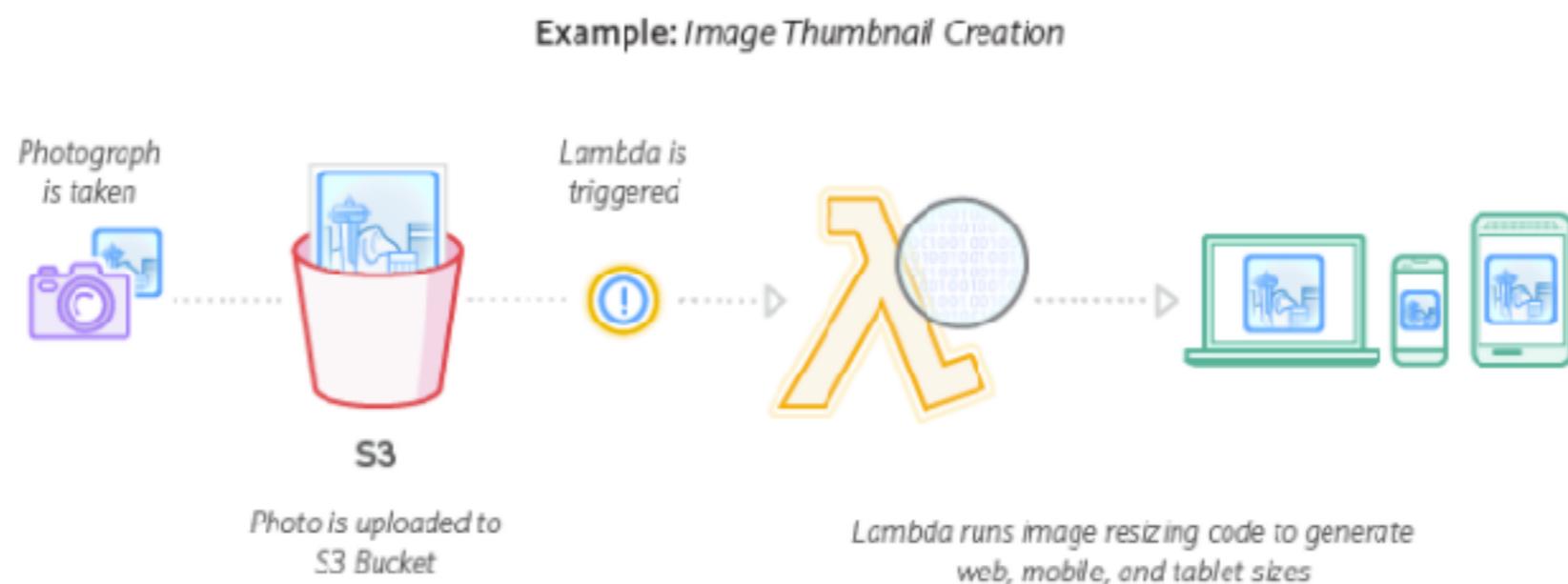
Cons

- vendor specific
- testing
- lack of tooling

- microservices
- processing items in a queue
- inconsistent or unknown traffic
- minimum viable products (MVP)
- IoT

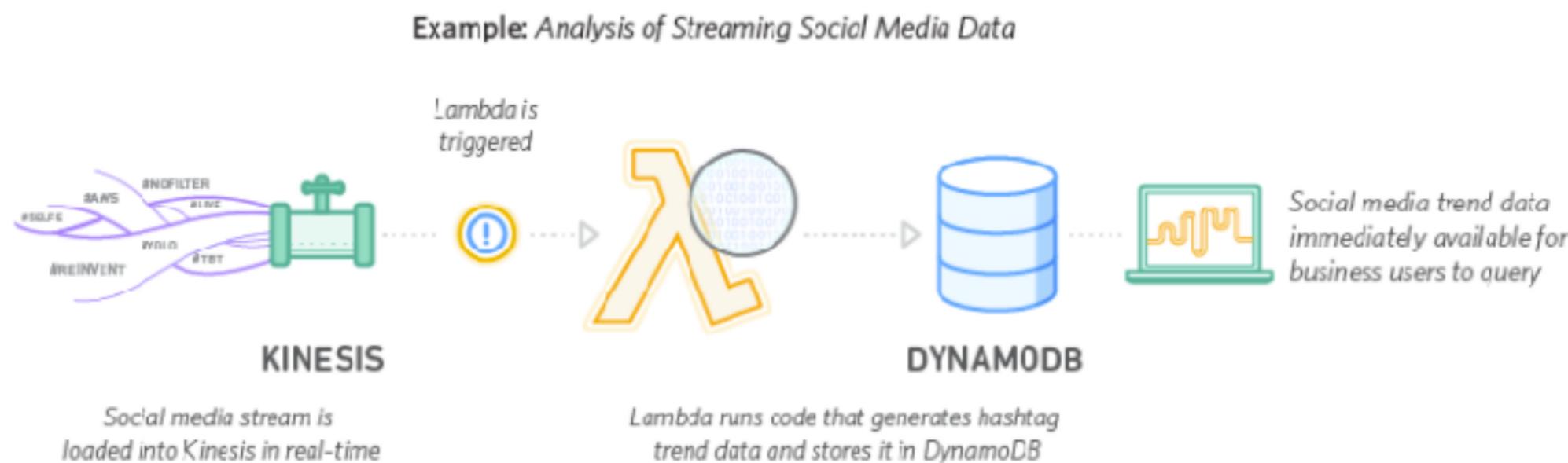
Real-time File Processing

You can use Amazon S3 to trigger AWS Lambda to process data immediately after an upload. For example, you can use Lambda to thumbnail images, transcode videos, index files, process logs, validate content, and aggregate and filter data in real-time. **Reference Architecture:** [Diagram](#) | [Sample Code](#)



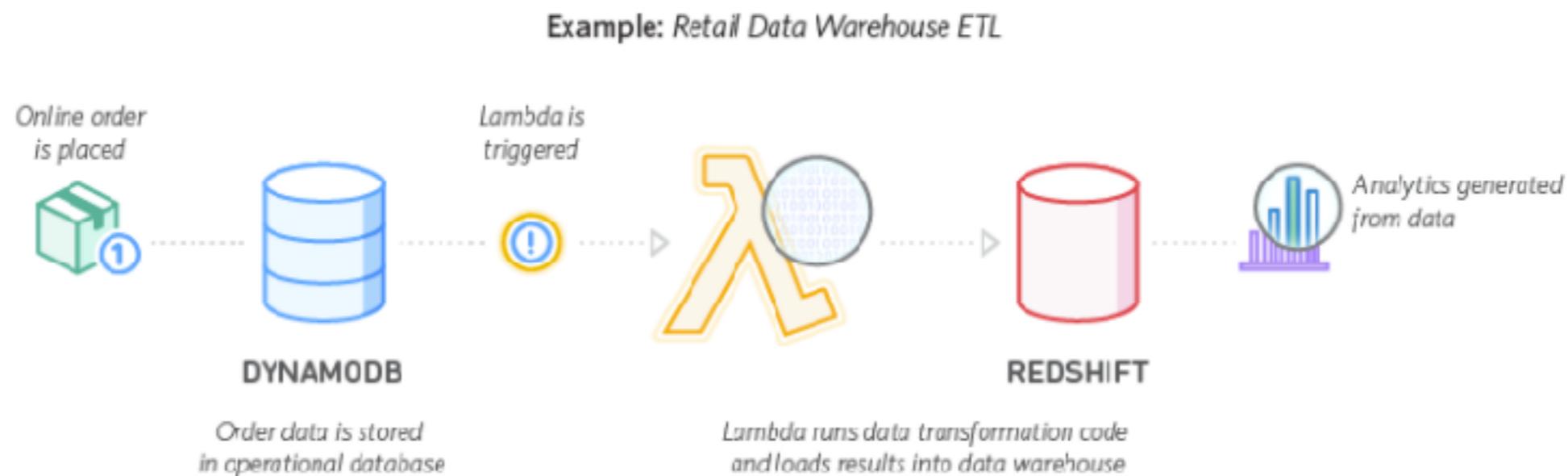
Real-time Stream Processing

You can use AWS Lambda and Amazon Kinesis to process real-time streaming data for application activity tracking, transaction order processing, click stream analysis, data cleansing, metrics generation, log filtering, indexing, social media analysis, and IoT device data telemetry and metering. **Reference Architecture:** [Diagram](#) | [Sample Code](#)



Extract, Transform, Load

You can use AWS Lambda to perform data validation, filtering, sorting, or other transformations for every data change in a DynamoDB table and load the transformed data to another data store. [Reference Architecture: Diagram](#)



IoT Backends

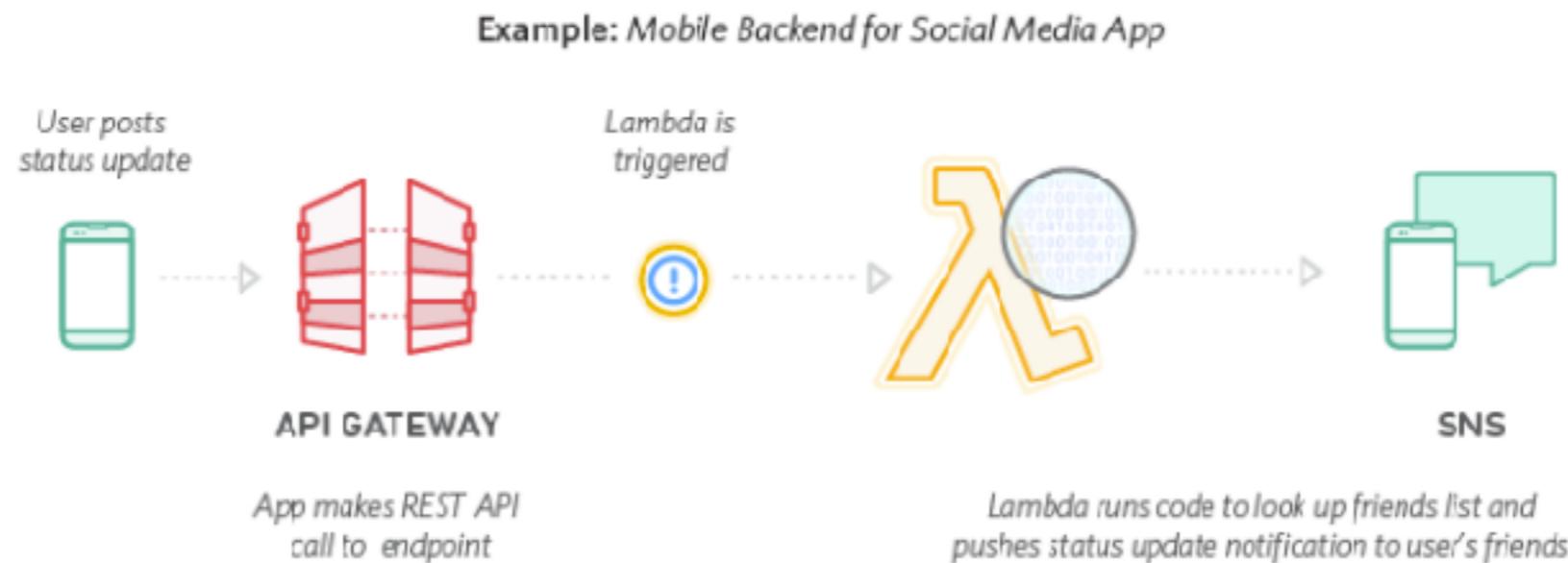
You can build backends using AWS Lambda and Amazon Kinesis for Internet of Things (IoT) device data telemetry and analysis. **Reference Architecture:** [Diagram](#) | [Sample Code](#)

Example: Sensors in Tractor Detect Need for a Spare Part and Automatically Place Order



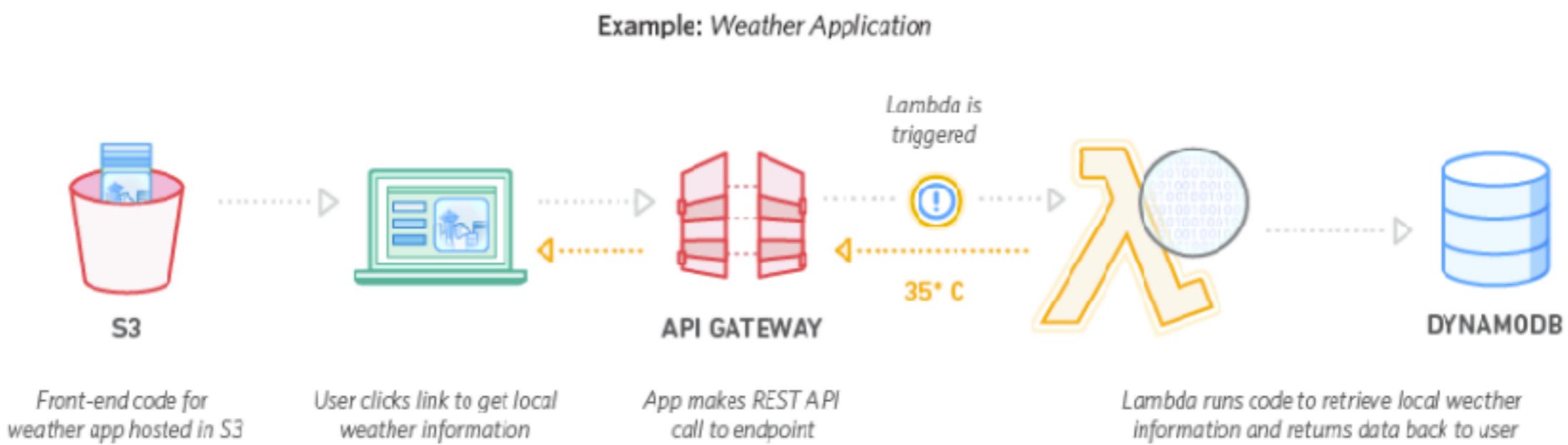
Mobile Backends

You can build backends using AWS Lambda and Amazon API Gateway to authenticate and process API requests. Lambda makes it easy to create rich, personalized app experiences. **Reference Architecture: Diagram | Sample Code**



Web Applications

By combining AWS Lambda with other AWS services, developers can build powerful web applications that automatically scale up and down and run in a highly available configuration across multiple data centers – with zero administrative effort required for scalability, back-ups or multi-data center redundancy. **Reference Architecture:** [Diagram](#) | [Sample Code](#)



RESOURCES

SERVERLESS
FRAMEWORK
VERSION 1.0

Build auto-scaling, pay-per-execution, event-driven apps on AWS Lambda

 WATCH THE VIDEO

 READ THE DOCS

```
***  
# Install serverless globally  
$ npm install serverless -g  
# Create an AWS Lambda function in Node.js  
$ serverless create --template aws-nodejs  
# Deploy to live AWS account  
$ serverless deploy  
# Function deployed!  
$ http://api.amazon.com/users/update
```

-> Read the [docs](#) or connect with the [community](#)

Announcing  [Terraform Enterprise](#). Collaborative Infrastructure Automation [Find out more >](#)



TERRAFORM by HashiCorp 

[Intro](#) [Docs](#) [Community](#)

 [Download](#)

 [GitHub](#)



WRITE,

Terraform enables you to safely and predictably create, change, and improve production infrastructure. It is an open source tool that codifies APIs into declarative configuration files that can be shared amongst team members, treated as code, edited, reviewed, and versioned.

[GET STARTED »](#)

Serverless Architectures

Serverless architectures refer to applications that significantly depend on third-party services (known as Backend as a Service or "BaaS") or on custom code that's run in ephemeral containers (Function as a Service or "FaaS"), the best known vendor host of which currently is AWS Lambda. By using these ideas, and by moving much behavior to the front end, such architectures remove the need for the traditional 'always on' server system sitting behind an application. Depending on the circumstances, such systems can significantly reduce operational cost and complexity at a cost of vendor dependencies and (at the moment) immaturity of supporting services.

04 August 2016



Mike Roberts

Mike is an engineering leader living in New York City. While spending much of his time these days managing people and teams he also still gets to code occasionally, especially in Clojure, and has opinions about software architecture. He is cautiously optimistic that Serverless architectures may be worth some of the hype that they are currently receiving.

Find similar articles at the tag:
[application architecture](#)

Contents

[expand](#)

What is Serverless?

A couple of examples

Unpacking 'Function as a Service'

What isn't Serverless?

Benefits

Reduced operational cost

BaaS - reduced development cost

FaaS - scaling costs

Easier Operational Management

'Greener' computing?

Drawbacks

Inherent Drawbacks

Implementation Drawbacks

The Future of Serverless

Mitigating the Drawbacks

The emergence of patterns

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WITH Sam Kroonenburg



MANNING





Christopher M. Judd



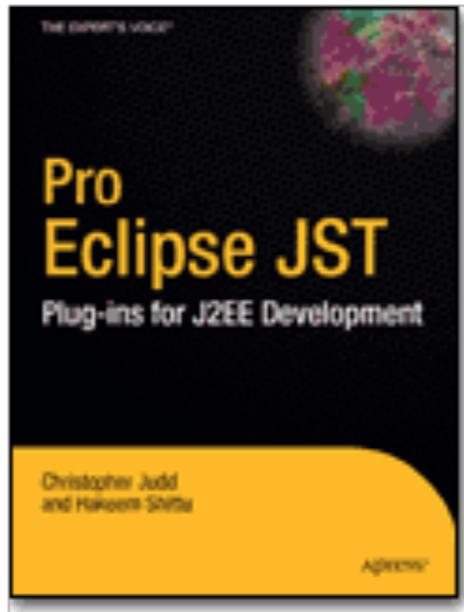
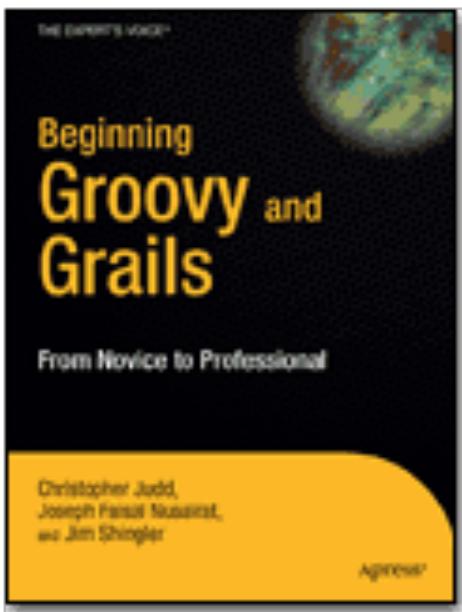
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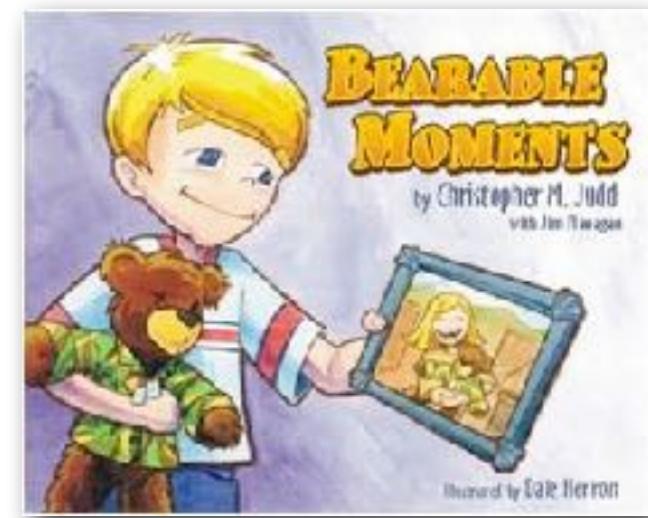
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A screenshot of a web page titled 'Getting Started With Docker' by Christopher M. Judd. The page includes a diagram showing the Docker architecture with clients, hosts, and registries, and sections on Docker Images, Docker Container, Docker Client, and Docker Host.





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