Serverless Python

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These slides online at

https://mjbright.github.io

/Talks/2018-Nov-15-

About Myself

- British - living in Grenoble, in the French Alps
- Cloud Native Trainer *@mjbright*
- Docker Community Lead
- Python User Group Creator
- Kubernetes CKA
- Crazy about Open Source and Cloud Technologies

Serverless Computing

What Is Serverless?

Serverless

- No more servers ?!
- The ultimate
"Cloud Native" ?

Serverless: a paradigm

- & a company
- & a tool

FaaS + BaaS

- Functions as a Service
- Back-ends as a Service
- Functions glue together API-based
back-end services

Serverless - What Is it?

At the peak of the Hype Cycle!!

NOT CARING ABOUT SERVERS

Developers focus on apps
Platform provider
- Provisions
- Auto-scales
- Maintains

PAY AS YOU GO

- (*)Pay for real (fn) usage
- (*)No initial investment
- (*)High availability for free
- Great for startups

AGILE

- Short time to market
- Enables innovation
- (*)Massive scale on demand

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*  —  These are the promises of Serverless
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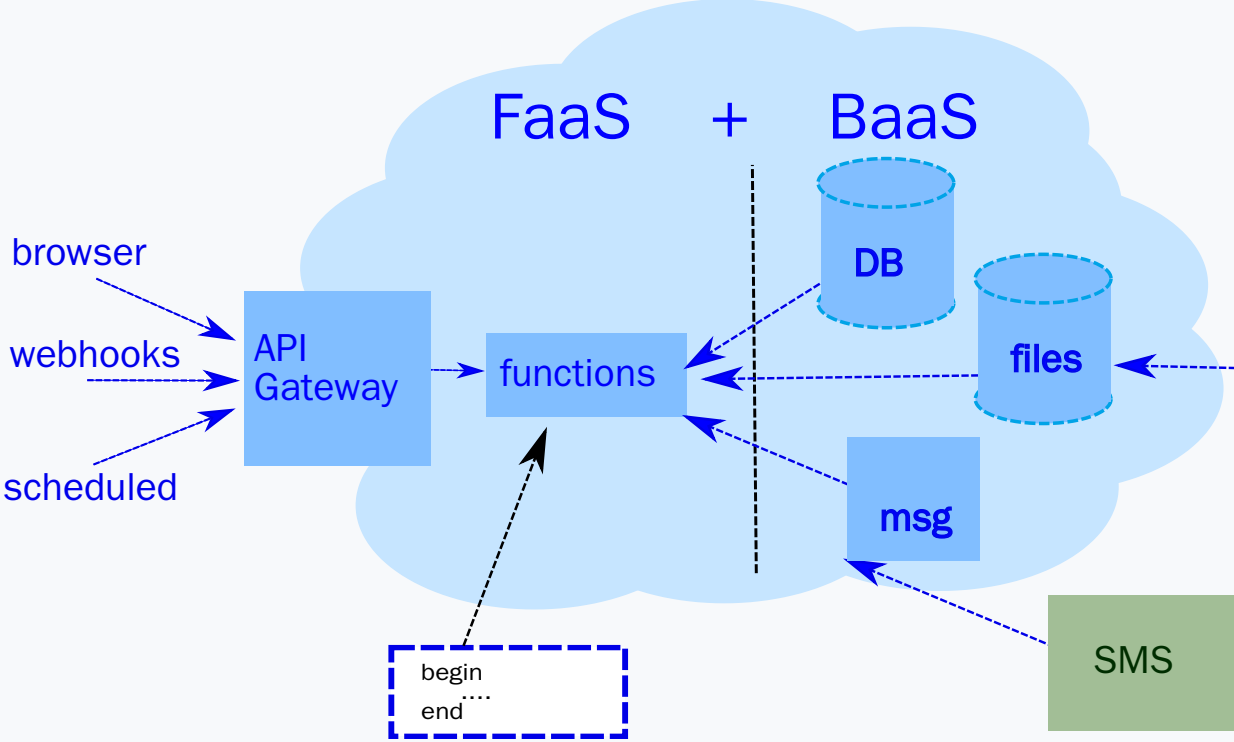# Serverless - The making of ...

BAREMETAL

VIRTUAL MACHINES

Serverless - an Event Driven Architecture

Serverless - Cloud Providers

Serverless - Main Cloud Provider Offerings

AWS LAMBDA

AZURE FUNCTIONS

GOOGLE CLOUD FUNCTIONS

IBM CLOUD FUNCTIONS

AWS Lambda

Introduced βeta in Nov 2014
Leader in developer uptake, back-end services and eco-system.

Language choices: Node.js (JS), Python, Java 8, C#, VB/F#

NEW Features [Reinvent 2017] - **Go**(static binaries) and **.Net(C#)**, **SAM for off-line debugging**

Cost: Free tier: 1 mn req/mth, then $0.00001667/GBy-sec details
Strengths: Created the space, enormous ecosystem, Cloud9 IDE?
Weaknesses: A little slow, limited languages, lock-in

Azure Functions

— *Introduced in 2016*

Many language choices:

GA: JavaScript, C#, F#, Python

Exp: Python, PHP, Typescript, Batch/Bash, PowerShell, Java

OpenSource runtime:
https://github.com/Azure/azure-functions-host

Excellent Developer Tools Azure Portal,

Google Cloud Functions

— *Alpha release in Feb 2016.*
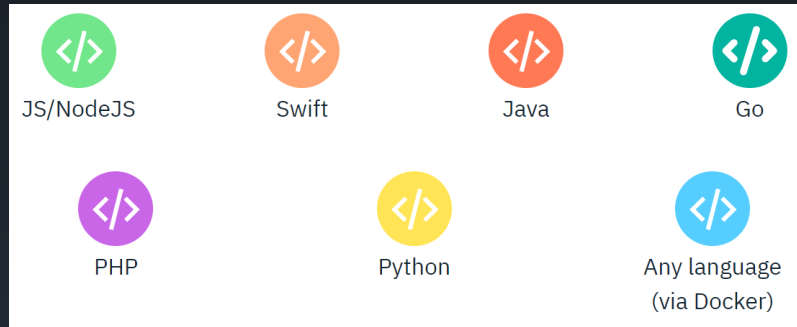
Language support:
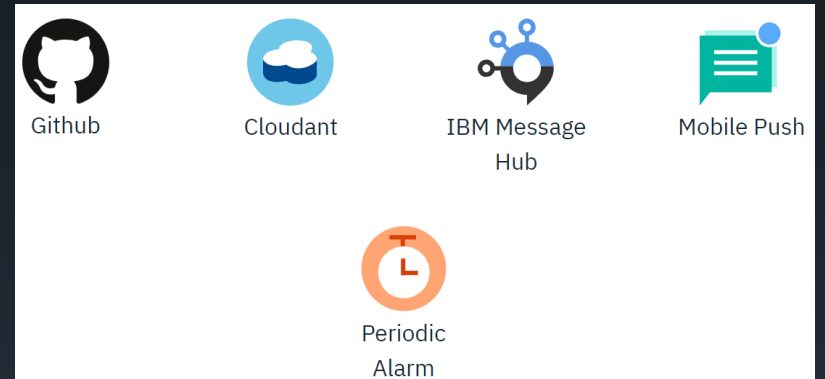
Node.js/JS and Python(beta).

IBM Cloud Functions

— *Experimental release in Feb 2016*

Open Sourced as Apache OpenWhisk *https://github.com/apache/incubator-openwhisk*

Runtime support:

JS/NodeJS   Swift   Java   Go

PHP   Python   Any language (via Docker)

Events support:

Github   Cloudant   IBM Message Hub   Mobile Push

Periodic Alarm
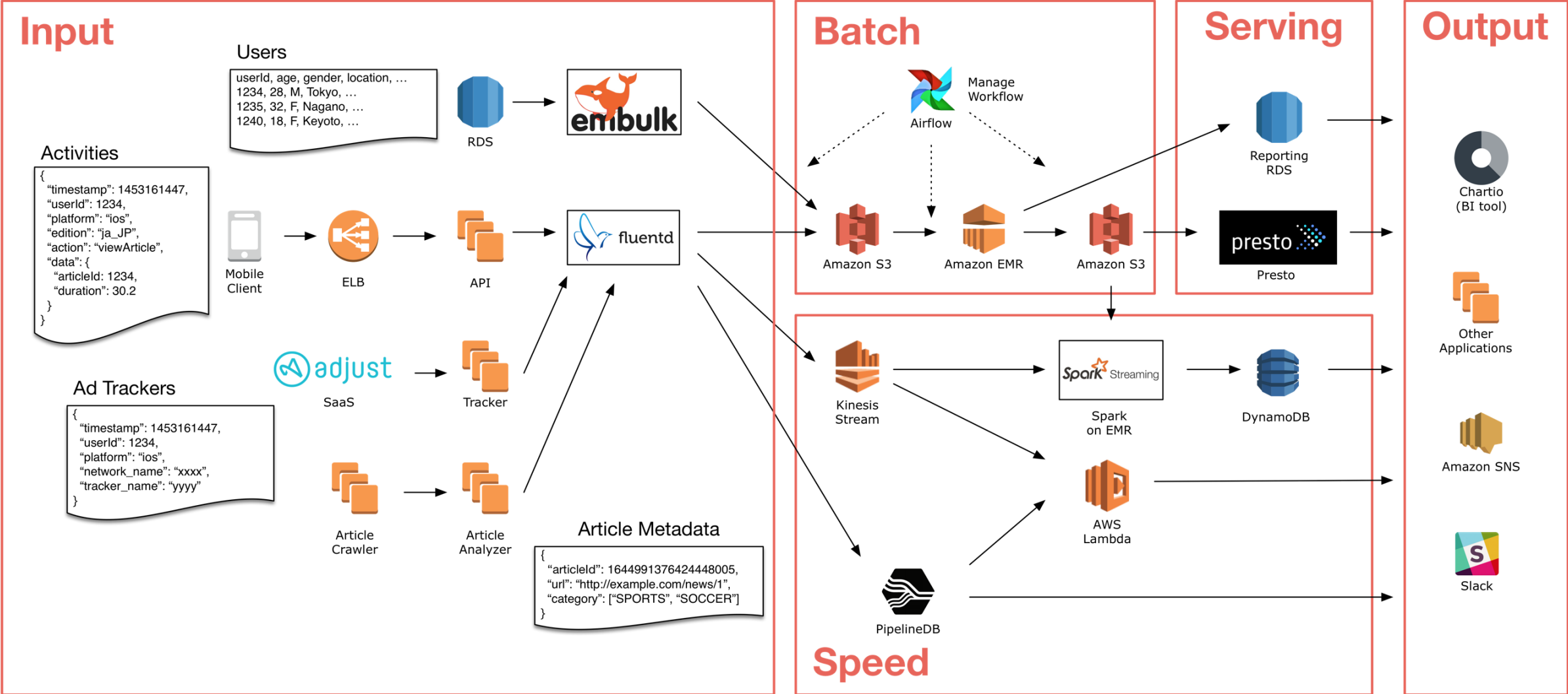
AWS Lambda: Use Case - Smart News

Potentially **huge** cost savings for your business, or not ... **Source:**
"The hidden costs of serverless"
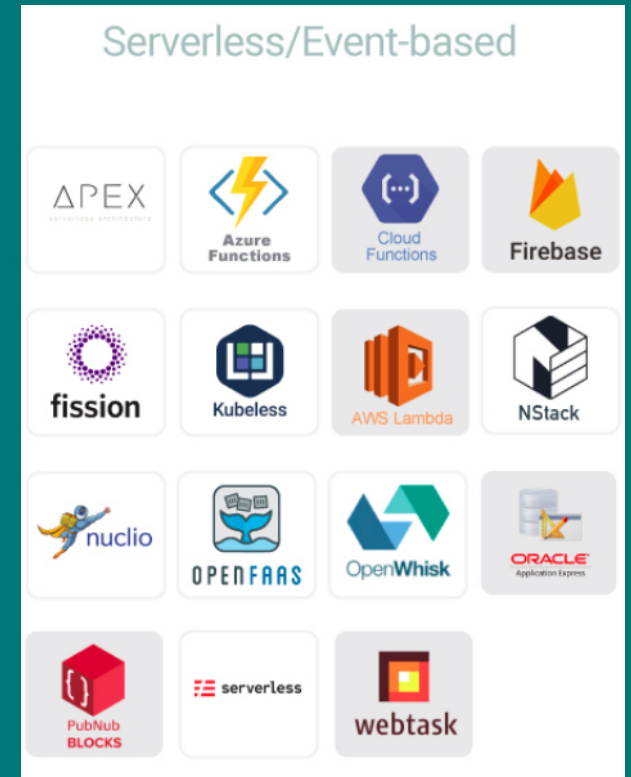
The CNCF Created a Serverless WG

We need open standards for Serverless

The working group defines/identifies

* common terminology

* common use cases and patterns

* relation to PaaS and container orchestration

Resources

𝓰 *Serverless Whitepaper*

 Github repository

𝓰 Google group

⌗ Slack channel

▶ Meeting Videos

𝓰 Meeting Minutes

Serverless/Event-based

kNative

Google released kNative in 2018
A framework for providing common facilities to
Serverless platforms.
- Orchestrating source-to-container builds
- Event binding
- Traffic management
- Built on Kubernetes and Istio

Serverless - Open-Source Tooling

Hundreds of Open-Source tools facilitate development, testing and deployment

See

awesome-serverless

Some tools seek to support multi-language, some multi-platform or a combination …

Some Important Frameworks

Serverless(.com)
apex(.com)
Zappa, Chalice (AWS Lambda/Python)

SERVER⚡LESS

A Company, a Tool, an Open-Source Project

Deploys to various Cloud Providers/Open Source Platforms:
- AWS Lambda
- Azure Functions
- Google Cloud Functions
- OpenWhisk
- Kubeless
- SpotInst
- Webtasks

Serverless Python !!

Serverless Python Frameworks ...

APEX

SUPPORTS:

Javascript   Python

++ Go

Chalice

CHALICE

SUPPORTS:

Python / Flask-like

Chalice

— *Open sourced by AWS - Python/AWS λ*

pip installable module, command-line tool

Demo Time - Chalice !

Serverless - Open Source Platforms
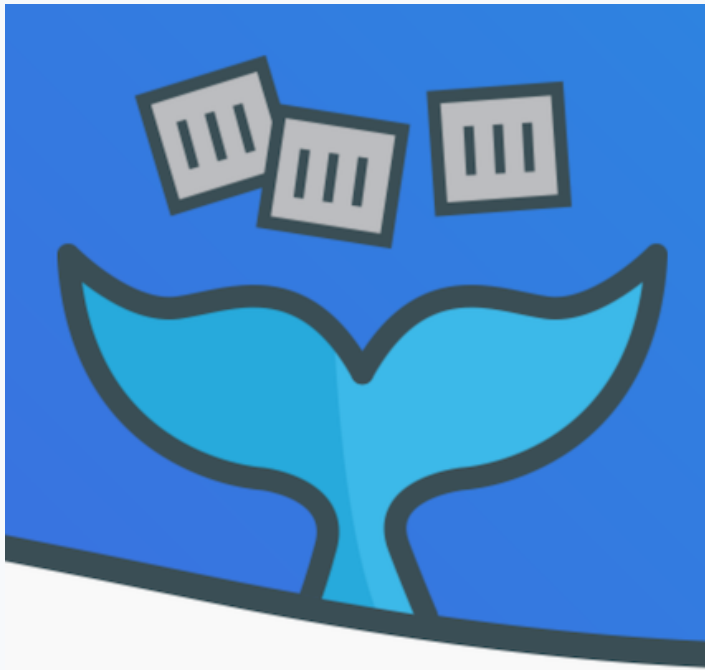
KUBELESS

FISSION

APACHE OPENWHISK

OPENFAAS

FN PROJECT

NUCLIO

SPRING CLOUD FUNCTIONS

OpenFaaS

- OpenFaaS runs on Docker-Swarm or Kubernetes
- **Bring Your Own Container**
- Portal with Function Store
- faas-cli: command-line tool
- FaaS-Netes runs on Kubernetes
- A young project with a **vibrant community** of volunteers
- Easy to get started, many guides and blog posts from community
- Integrates Prometheus
- **OpenFaaS Cloud** initiative for GitOps

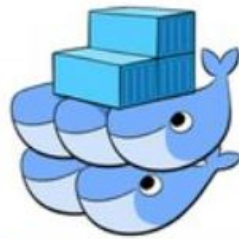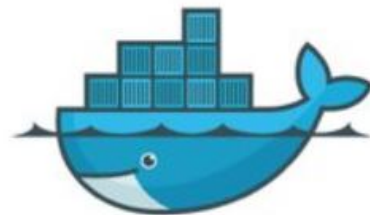— *Alex Ellis, Docker Captain, *VMWare**

OpenFaaS - Architecture

OpenFaaS - Finnian Anderson, Colourising Video with OpenFaaS

Alfred Hitchcock's "Psycho" trailer, recolourised using OpenFaaS

Demo Time - OpenFaaS !

To Summarize

- Serverless is *still* a young technology
- It has a lot of promise for many workloads
- There are *real* **cost savings** to be made on opex and capex
- Major cloud players are investing in the technology
- There are many deployment choices today
- **We need an open cloud**

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Resources - 1

RESOURCE	DESCRIPTION	URL
Lists		
awesome-serverless	Curated list of awesome services, solutions and resources for serverless / nobackend applications.	[github] anaibol/awesome-serverless
awesome-Serverless(.com)	Curated list of resources related to serverless architectures and the **Serverless Framework**	[github] JustServerless/awesome-serverless
Tools		
Serverless	Tools for deploying to several Cloud Providers	[github] serverless/serverless
Apex	Tools for deploying to AWS Lambda	[github] apex/apex

Resources - 2

RESOURCE	DESCRIPTION	URL
Cloud Providers		
AWS Lambda	Amazon's Serverless Platform	https://aws.amazon.com/fr/lambda/
Azure Functions	Microsoft's Serverless Platform	https://azure.microsoft.com/en-us/services/functions/
Google Cloud Functions	Google's Serverless Platform	https://cloud.google.com/functions/
IBM Cloud Functions	IBM's Serverless Platform	https://www.ibm.com/cloud-computing/bluemix/openwhisk

Resources - 3

RESOURCE		DESCRIPTION	URL
Open Source Serverless Platforms			
Kubeless	url	Serverless platform from Bitnami	url
Fission.io	url	Serverless platform from Platform9	url
Apache OpenWhisk	url	Serverless platform from IBM	url
OpenFaaS	url	Serverless platform from Alex Ellis, Docker Captain	url
Serverless Python Frameworks			
Apex		Serverless framework supporting Python and other languages	url
Chalice		Serverless framework supporting Python / Flask	url
Lambdify		Serverless framework supporting Python	url
Zappa		Serverless framework supporting Python / WSGi	url

♡ **Thanks !**

🐦 @mjbright