

# FaaS (Functions as a Service) - aka Serverless

Michael Bright, 27 January 2018,  
DevConf.cz, Brno

These slides online at [https://mjbright.github.io/Talks/2018-Jan-27\\_Devconf.cz\\_Serverless](https://mjbright.github.io/Talks/2018-Jan-27_Devconf.cz_Serverless)



Developer Evangelist @

Containous

# Serverless Computing

## 1. What is Serverless?

- Your experiences?
- 

## 2. Review of Cloud Provider Offerings.

+CNCF Serverless WG

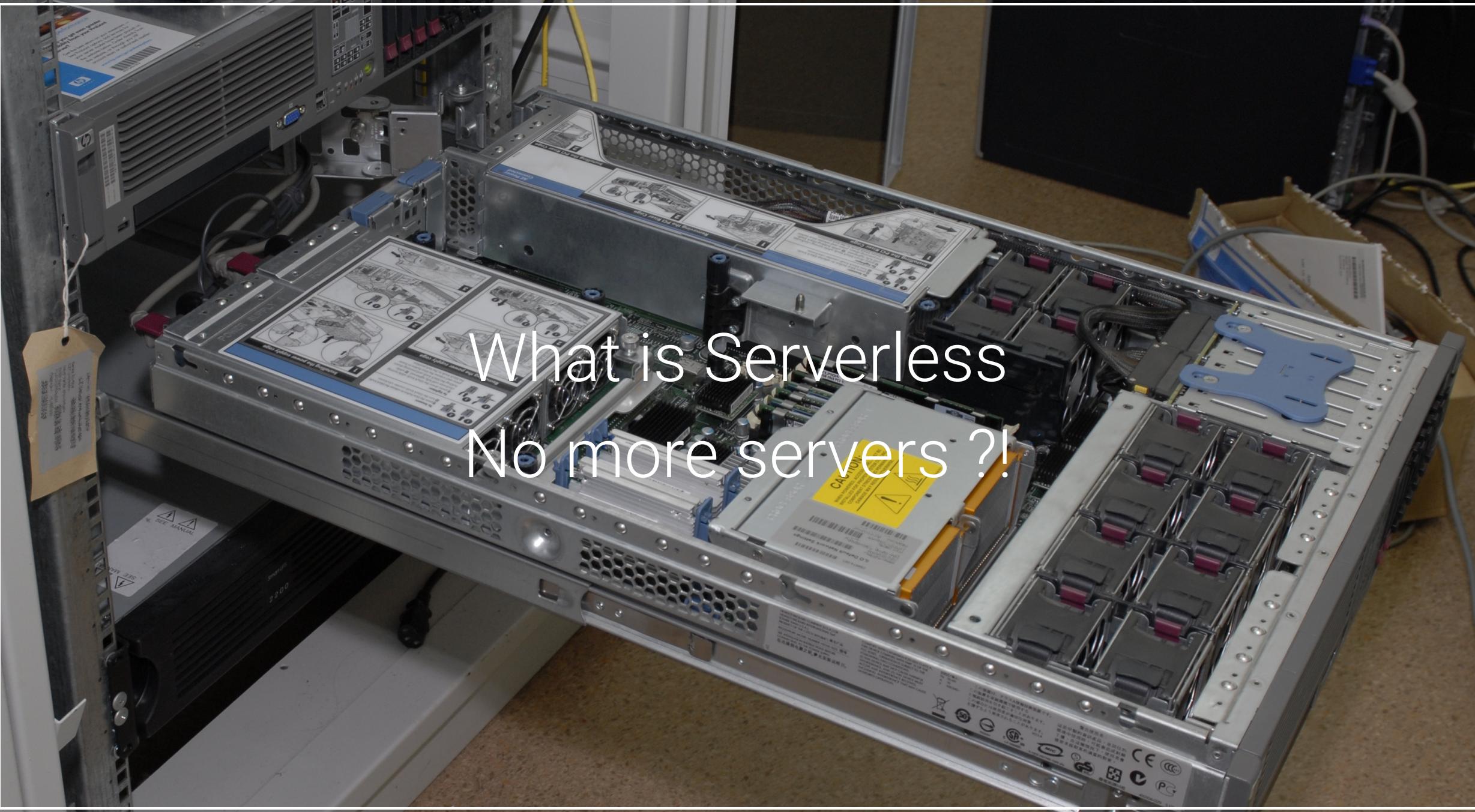
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## 3. Serverless Tools

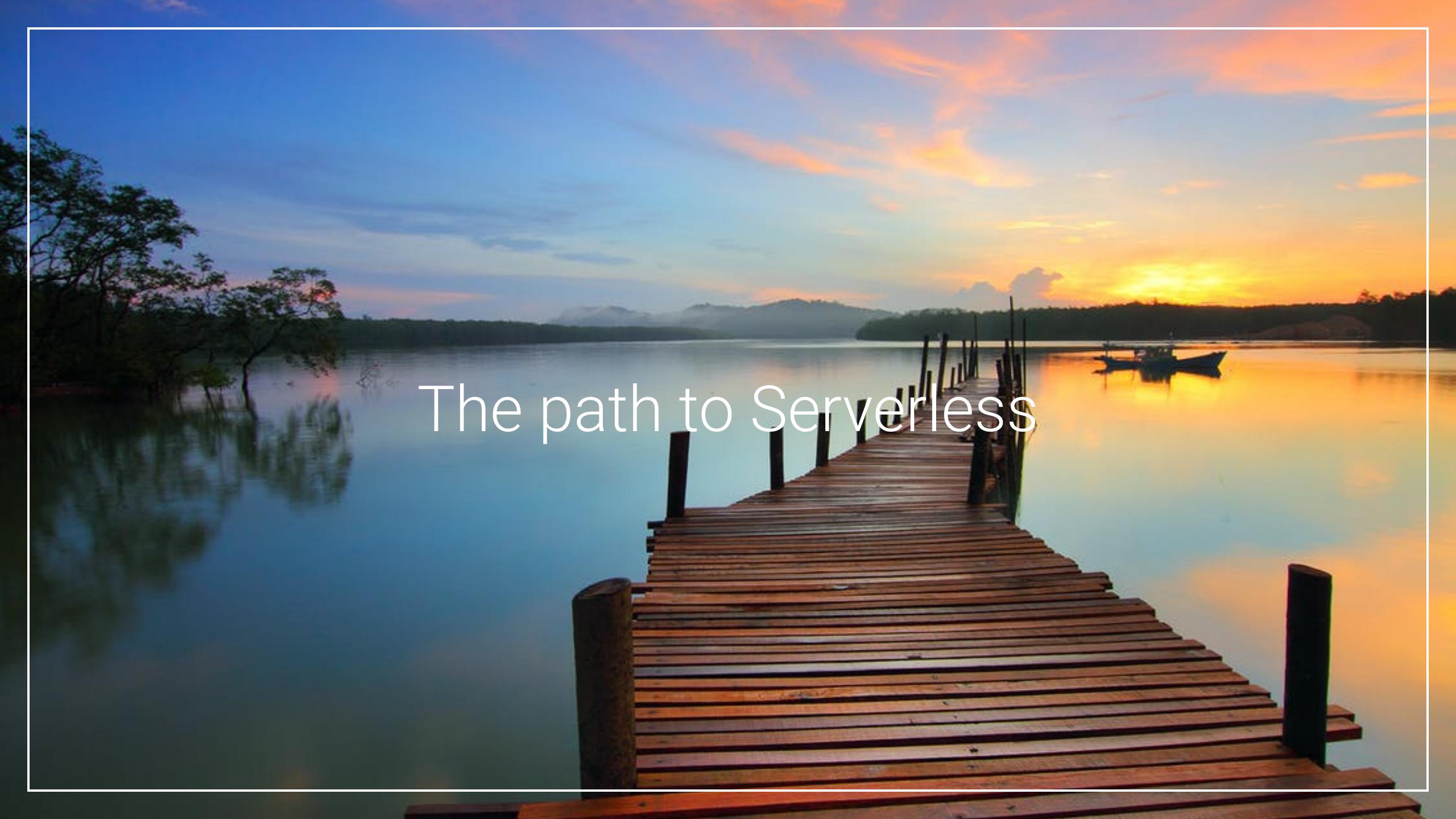
## 4. Serverless Platforms

Serverless In Action - demos

## 5.

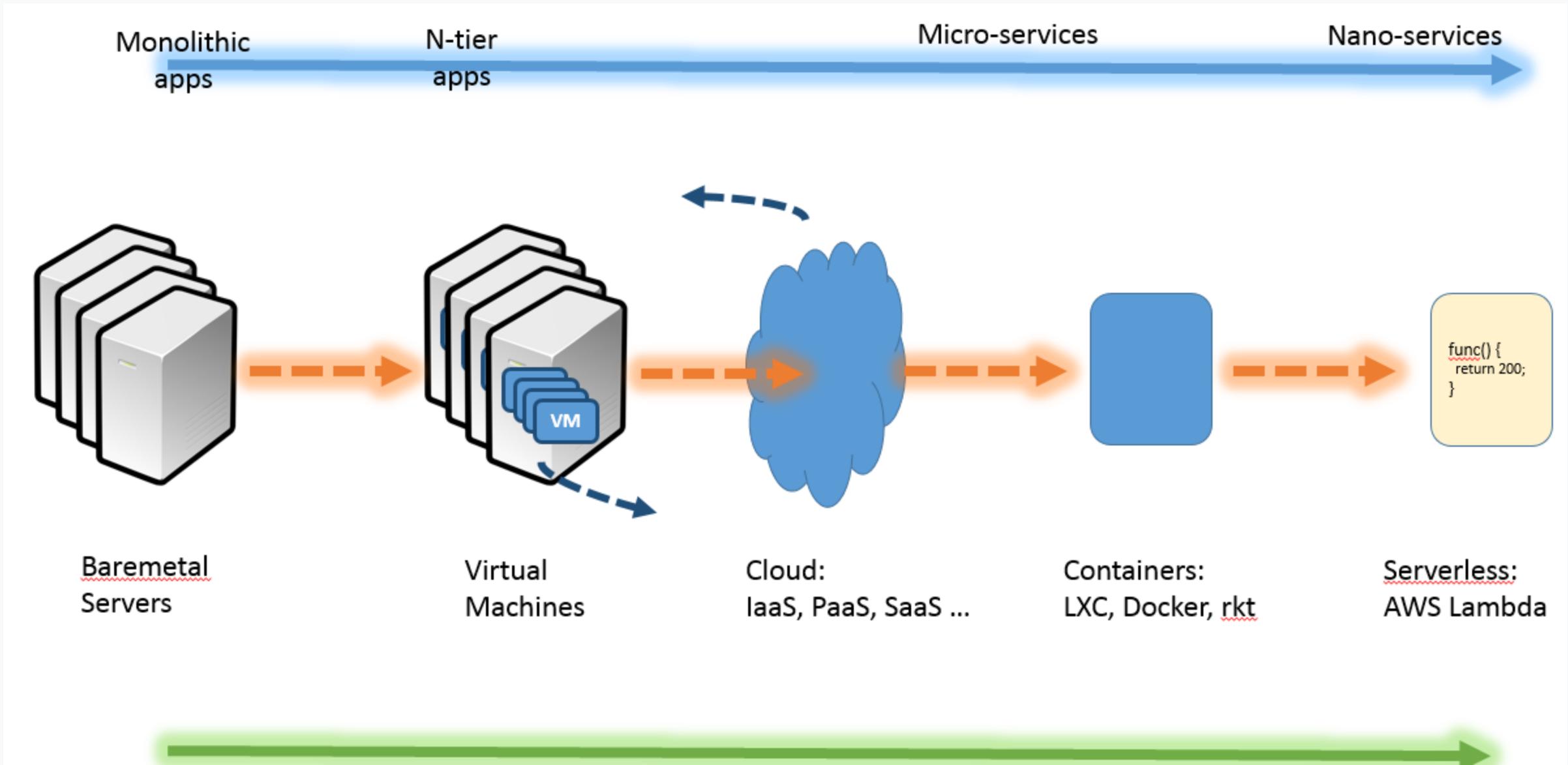


What is Serverless  
No more servers ?!

A photograph of a wooden pier extending from the bottom right towards the center of the frame, set against a backdrop of a calm lake or river. The sky is filled with warm, orange and yellow hues of a setting sun, with some darker clouds on the left. In the distance, a small boat is visible on the water. The overall atmosphere is peaceful and contemplative.

The path to Serverless

# Serverless - The making of ...



# Serverless - What is it? ...

At the peak of the Hype Cycle !!

## DON'T CARE ABOUT SERVERS

- Developers focus on apps
- Servers are auto-scaled
- No server provisioning

## BAAS

- Back-end as a Service - e.g. DB, messaging

## NOW FAAS + BAAS

- Functions as a Service - your stateless logic

## PAY AS YOU GO

- Pay for real usage (theory)
- No initial investment
- Great for startups

## AGILE

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

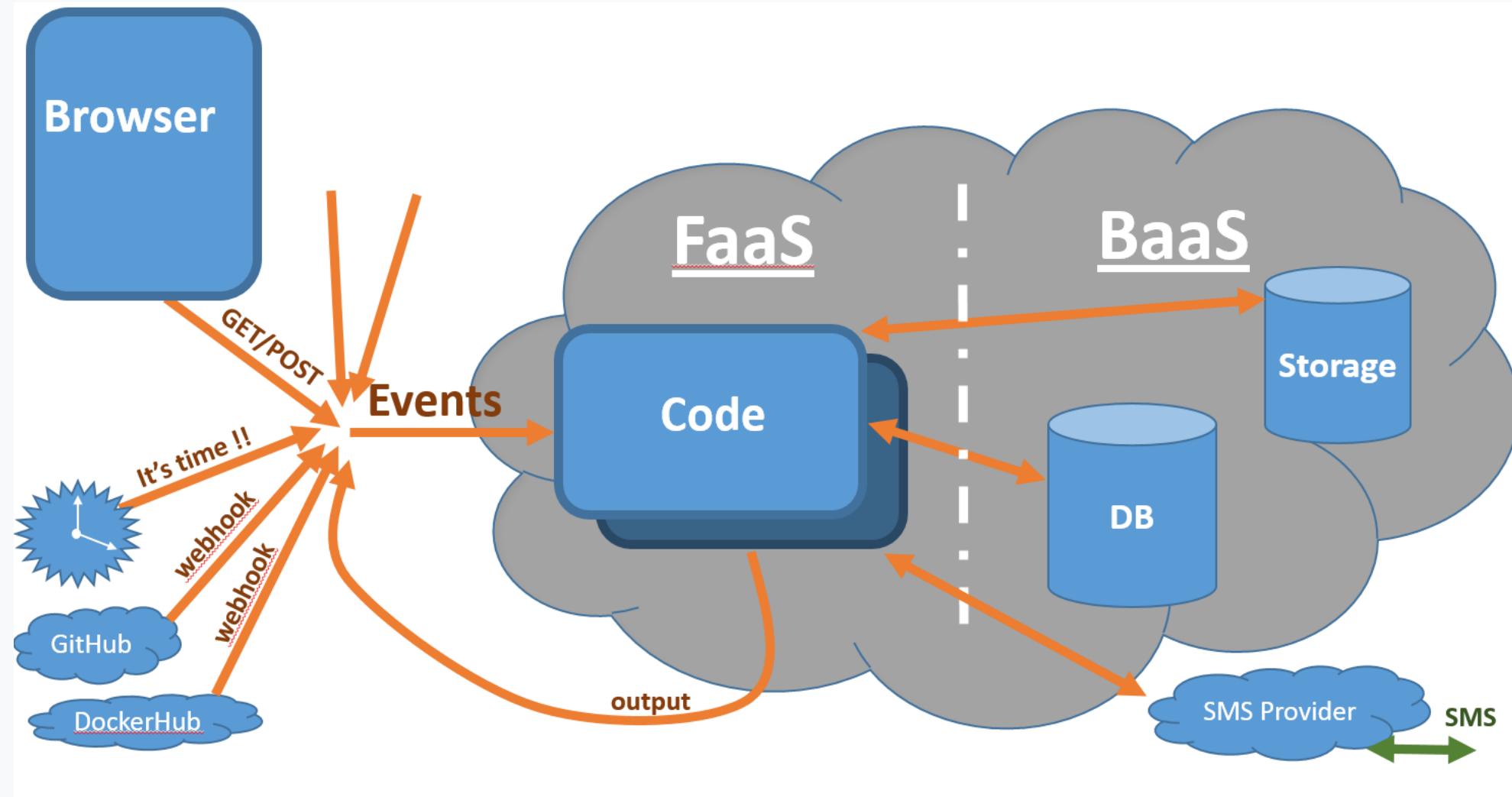
## ALSO A COMPANY!

- Unfortunately!
- Serverless(.com) provide deployment tools
- called Serverless !



The future of fast-food is Serverless

# Serverless - Event Driven Architecture



API Gateway allows external access to functions ...

# Serverless - What is it? ... Use Cases



# Serverless - What is it? ... Use Cases

Where it doesn't make sense to pay for always-on services

## PERIODIC

- monthly payroll
- weekly news
- daily summaries
- Bank check processing  
(with image recognition)

## UNPREDICTABLE

- git webhooks
- user web requests
- S3 file uploads
- SMS reception

## DOMAINS

- IoT
- Banking
- Glue-logic

## CHARACTERISTICS

- latency tolerant
- event-driven
- short-lived
- periodic



# Serverless - Cloud Providers



# Serverless - Cloud Provider Offerings



AWS LAMBDA



AZURE / AZURE FUNCTIONS



GOOGLE / GOOGLE CLOUD FUNCTIONS



IBM CLOUD FUNCTIONS



ORACLE CLOUD / FN





## AWS Lambda

### Overview

- Introduced *Beta* in Nov 2014, stable version by end of 2015.  
Leader in developer uptake, back-end services and eco-system.

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

**NEW: Go (static binaries) and .Net(C#)**

**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

### Overview

- *Introduced in May 2016*

**Many language choices:** JavaScript, C#, F#, Python, PHP, Bash, PowerShell ...

**Cost:** Free tier: 1 mn req/mth, then \$0.000016/GBy-sec [details](#)

**Strengths:** Win dev ecosystem, VStudio tools, Azure Stack

**Weaknesses:** still young, lock-in



## Google Cloud Functions

### Overview

- *Alpha release in Feb 2016.*

**Language support:** JavaScript only.

**Cost:** Free tier: 2mn req/mth, then \$0.0000004/GBy-sec [details](#)

**Strengths:** Google dev ecosystem, backend services

**Weaknesses:** Very young, Js only, commitment? Cost, lock-in



## IBM Cloud Functions

### Overview

- *Experimental release in Feb 2016*

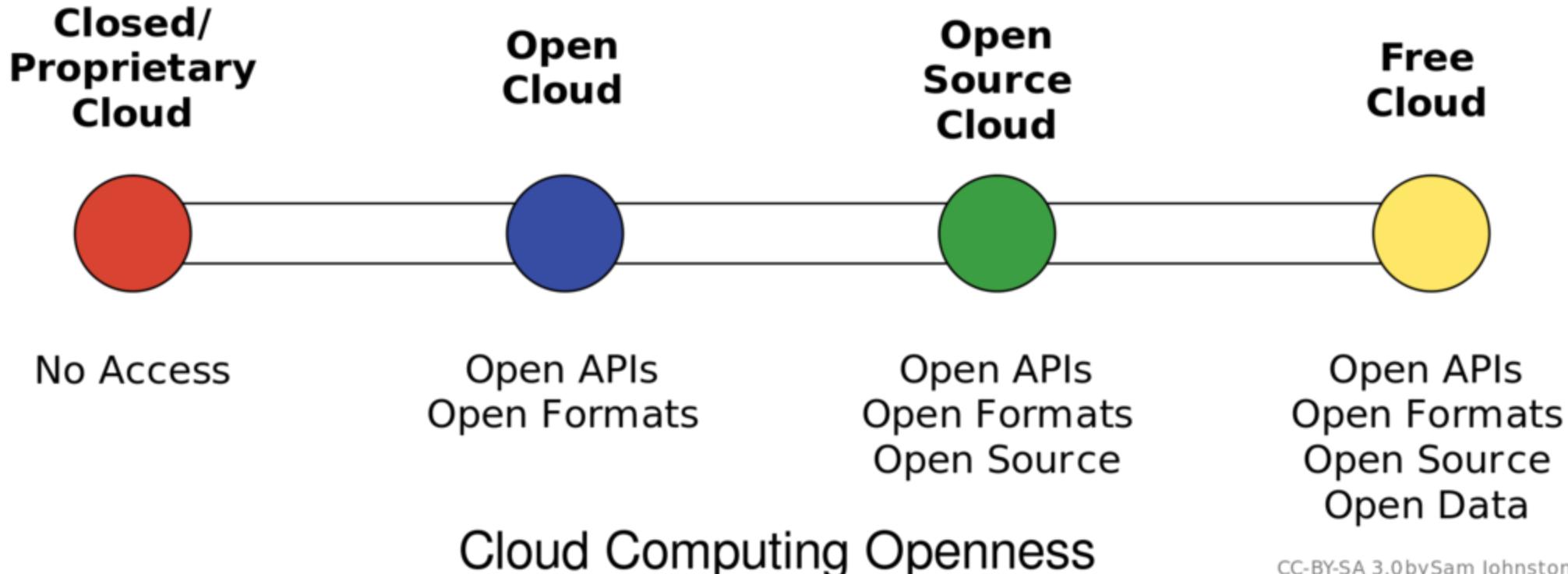
*Open Sourced as Apache OpenWhisk*

**Language support:** Node.js, Swift or BYoC

**Cost:** Free tier: 2mn req/mth, then \$0.0000004/GBy-sec [details](#)

**Strengths:** Open source community, RedHat/Adobe backing, Fast growth

**Weaknesses:** lock-in

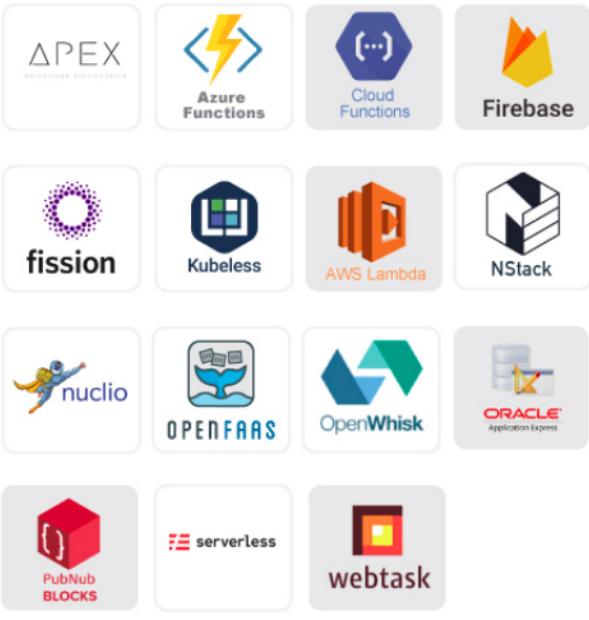


CC-BY-SA 3.0 by Sam Johnston

But we need open Serverless for open Cloud

# The CNCF has created a Serverless WG

Serverless/Event-based



# CNCF Serverless WG to

## **Provide clarity on the topic:**

- \* Define common terminology
- \* Define the scope of the space
- \* Identify common use cases and patterns
- \* Identify relation to PaaS and container orchestration

## **Identify potential next steps for the community:**

- \* Identify areas for harmonization or interop work

**Create a whitepaper on Serverless.**

# CNCF Serverless WG Resources

\* Github repo

 @cncf:wg-serverless

\* Google Group

 cncf-wg-serverless

\* Meetings

 Video playlist

Minutes

\* Whitepaper

 in Google Drive

\* Slack Channel

 #WP



# Serverless - Tools

# Serverless - Open Source tooling ...



SERVERLESS(.COM)



APEX(.COM)

SWAG



– Open Source project

*Deploy to various Cloud Providers/Open Source  
Frameworks:*

- - AWS Lambda
- - Azure Functions
- - Google Cloud Functions
- - OpenWhisk
- - Kubeless
- - SpotInst
- - Webtasks

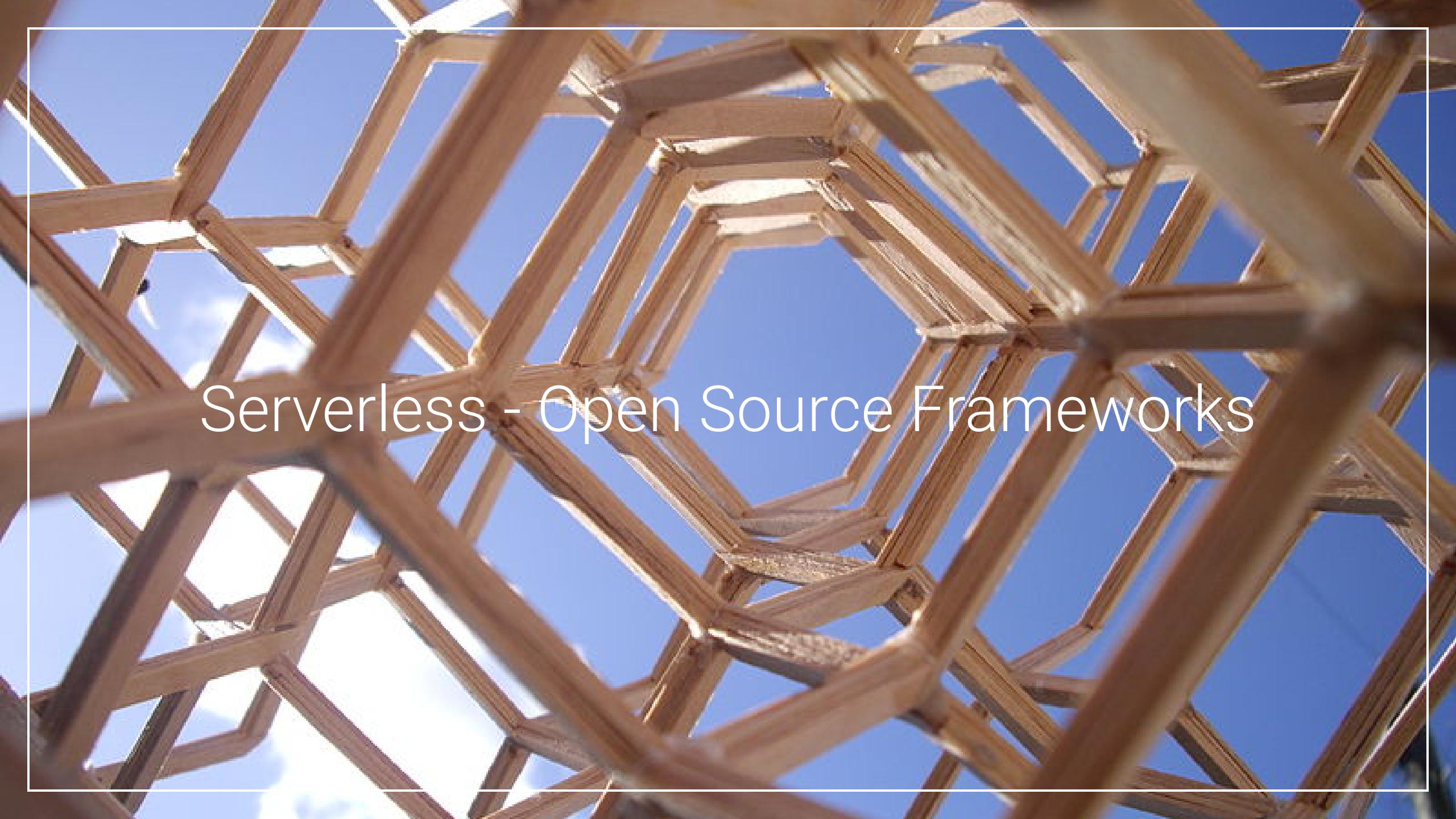
# APEX

- *Up is platform-agnostic, supporting AWS Lambda and API Gateway as the first targets.*

*Extends beyond Lambda's natively supported languages by supporting Golang*

*Up focuses on deploying "vanilla" HTTP servers, using existing frameworks such as*

*Express, Koa, Django, Golang net/http or others.*

A photograph of a wooden lattice structure, likely a roof or porch, against a clear blue sky. The wooden beams are light-colored and form a complex geometric pattern of triangles and hexagons. The perspective is looking up through the structure.

Serverless - Open Source Frameworks

# Serverless - Open Source Frameworks



KUBELESS



FISSION



APACHE OPENWHISK



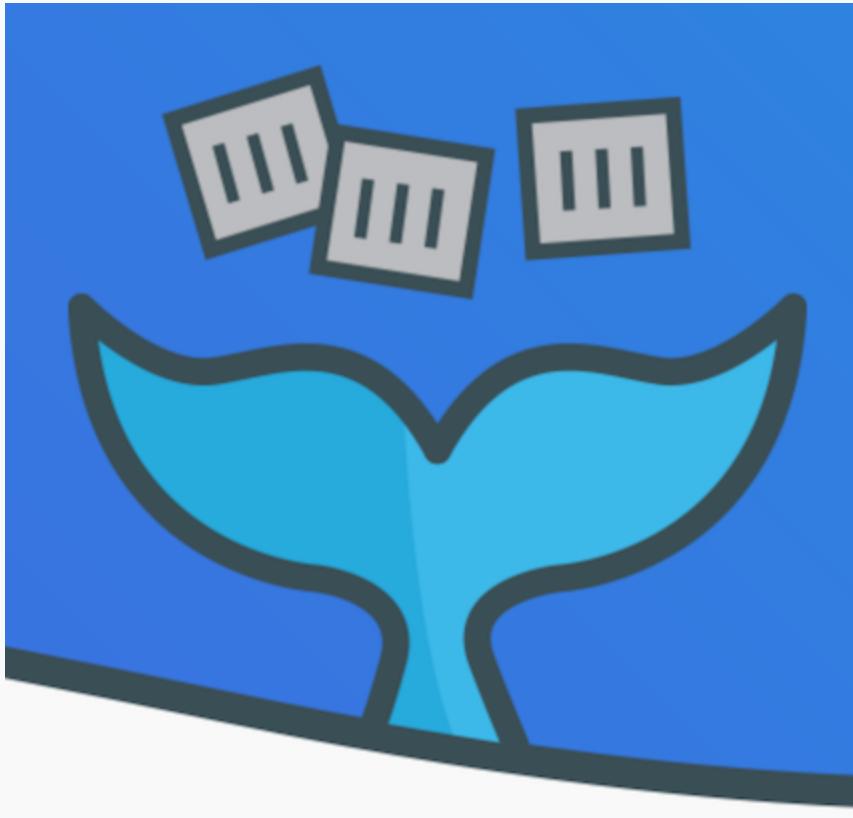
OPENFAAS



FN PROJECT



NUCLIO



## OpenFaaS

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

— *Alex Ellis, Docker Captain*

# OpenFaaS - Johhny Mkhael, Unleasing the Artist in you

# OpenFaaS - Finnian Anderson, Colourising Video with OpenFaaS Serverless Functions

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



# To summarize

- - Serverless is a new technology
  - - It has a lot of promise for many workloads
  - - All major Cloud players on investing in the technology
  - - **But we need an Open Cloud**
  - - "The ultimate Cloud Native"
  - - There are many deployment choices today
  - - As platforms mature we can expect more stable performance
-



Thanks !

@mjbright



# Resources - 1

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

# Resources - 2

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

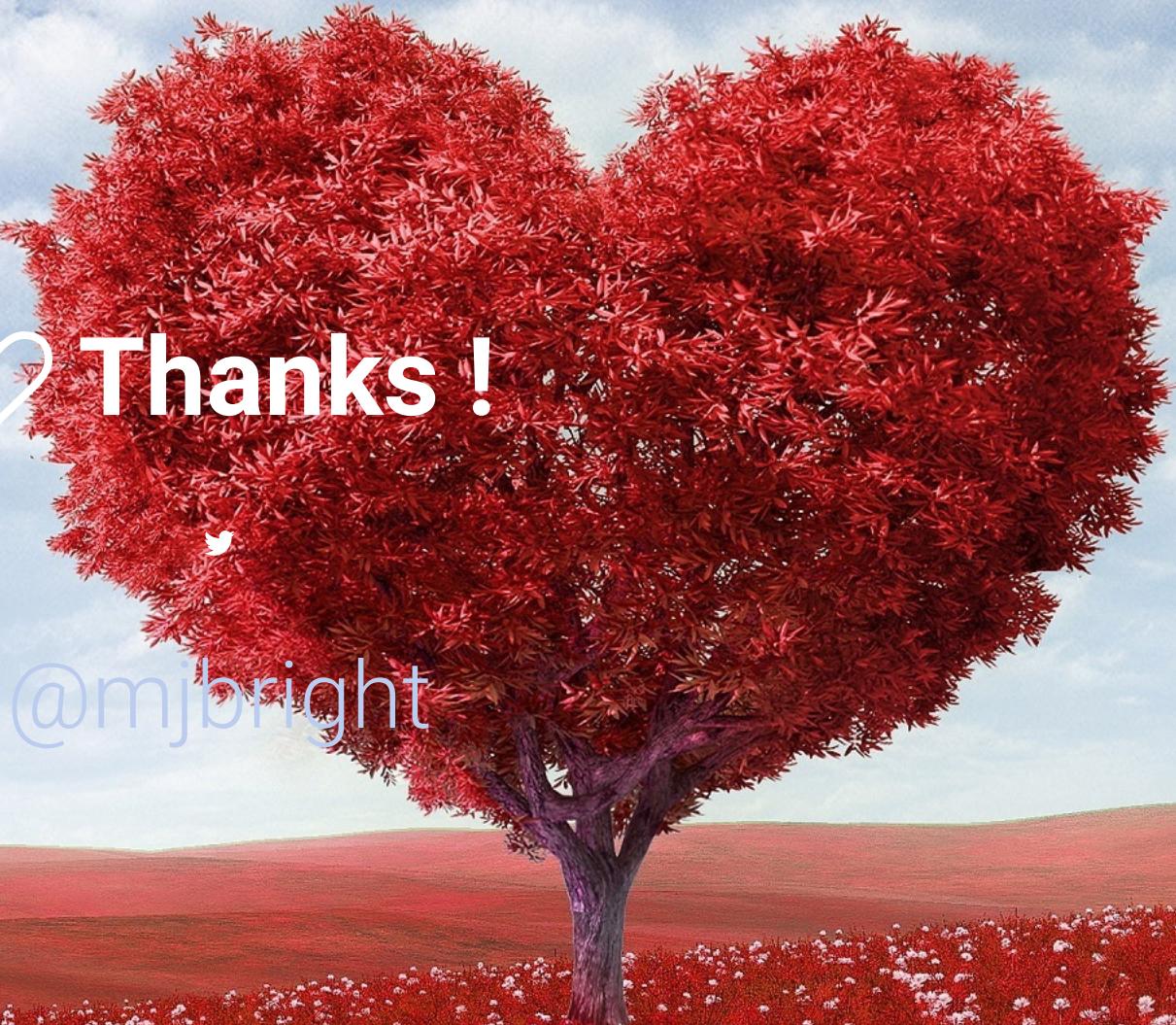
# Resources - 3

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



Thanks !

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# Chalice

Chalice

- Open sourced by AWS - Python/AWS  $\lambda$

*pip installable module, command-line tool*

# λambdify

Lambdify

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—



Zappa.io

- Open sourced by Gun.io - Python/AWS  $\lambda$

*pip installable module, command-line tool*

*Can run Django ... serverless (?)*