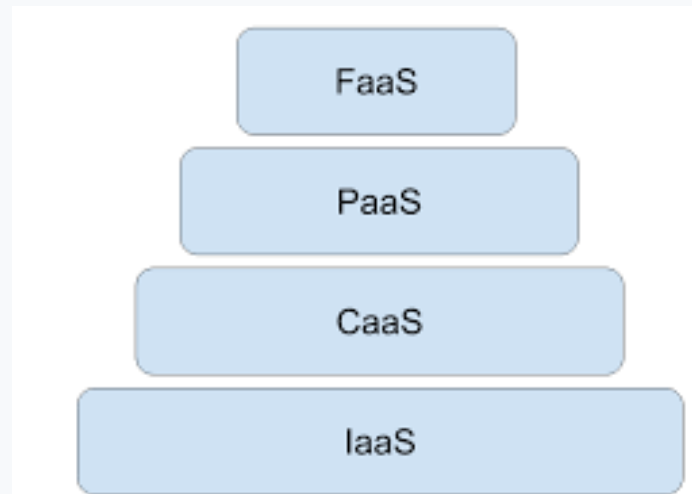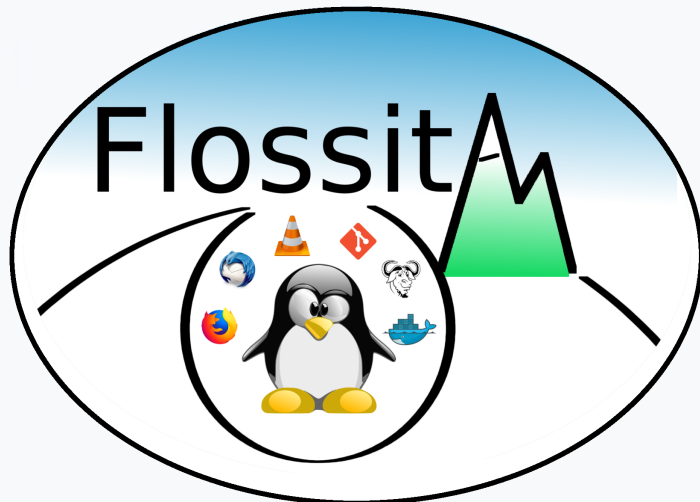# FaaS (Functions as a Service) - aka Serverless

Michael Bright, 19 January 2018,

FlossCon Grenoble

These slides online at https://mjbright.github.io/Talks/2018-Jan-FLOSSCon_Serverless

Serverless Computing

1.
What is Serverless?
Your experiences?

2.
Review of Cloud Provider Offerings.
+CNCF Serverless WG

3.
Serverless Tools

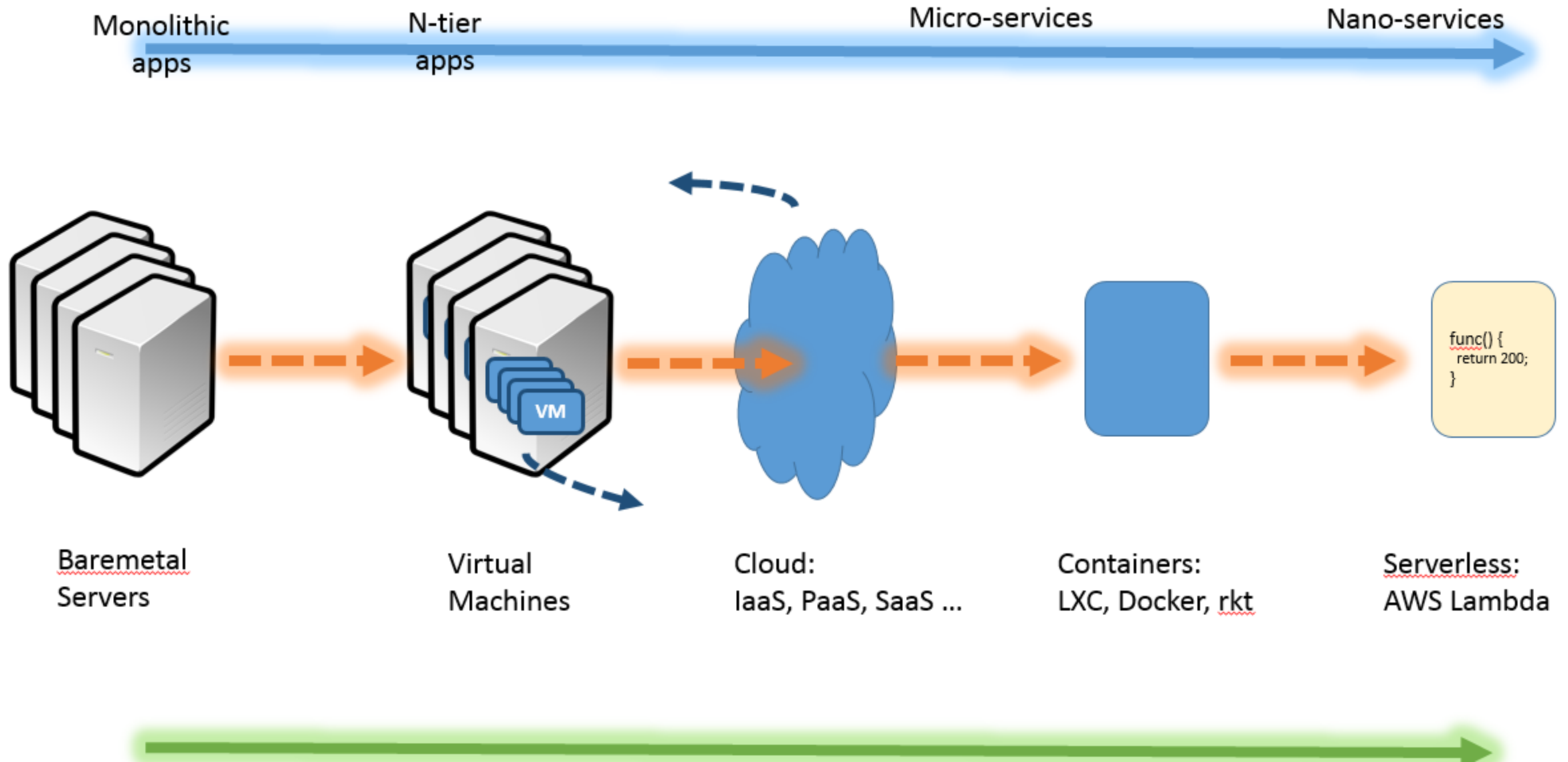4.
Serverless Platforms

Serverless In Action - demos

5.

What is Serverless
No more servers ?!

The path to Serverless

Serverless - The making of …

Monolithic apps → N-tier apps → Micro-services → Nano-services

Baremetal Servers

Virtual Machines

Cloud: IaaS, PaaS, SaaS …

Containers: LXC, Docker, rkt

Serverless: AWS Lambda

```
func() {
  return 200;
}
```

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

Applications accessing other cloud services ...

NOW FAAS + BAAS

Functions as a Service - your stateless logic

Functions accessing other cloud services ...

PAY AS YOU GO

- Pay for real usage
- No initial investment
- Great for startups

AGILE

Short time to market
Enables innovation

ALSO A COMPANY!

Unfortunately!

Serverless.com provide deployment tools

The future of fast-food is Serverless

Serverless - Event Driven Architecture

Browser

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

- quarterly analyses

- monthly payroll

- weekly news

- daily summaries

- Bank checks

  (with image recognition)

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

—   *Introduced βeta 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 on AWS Lamba

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 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

— *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

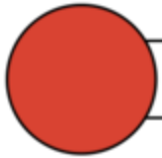— *Experimental release in Feb 2016*

Open Sourced as Apache OpenWhisk

Language support: *Node.js, Swift or BYoC*
Cost: *Free tier: 2mn req/mth, then $0.0000004/GBy-sec details*
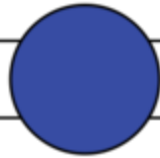**Strengths:** *Open source community, RedHat/Adobe backing, Fast growth*
Weaknesses: *lock-in*
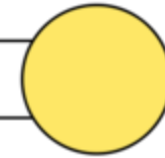
Cloud Computing Openness

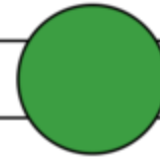But we need open Serverless for open Cloud

The CNCF has a created a Serverless WG
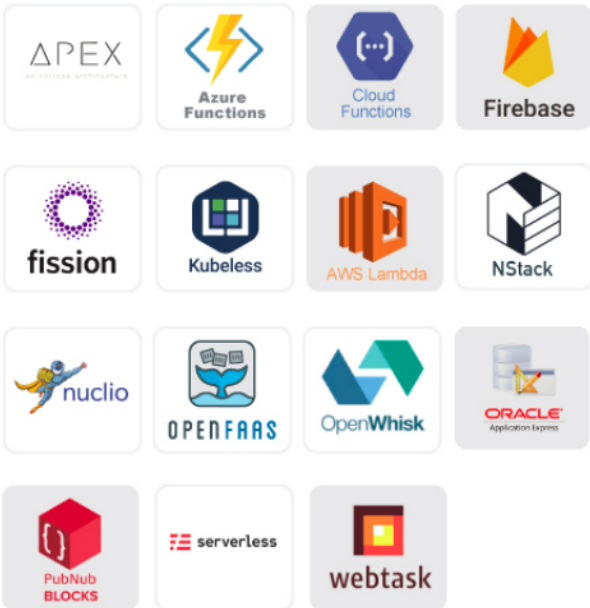
CNCF Serverless WG to

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

* Whitepaper
 in Google Drive

* Google Group
 cncf-wg-serverless

* Slack Channel
 # WP

* Meetings
 Video playlist
 Minutes
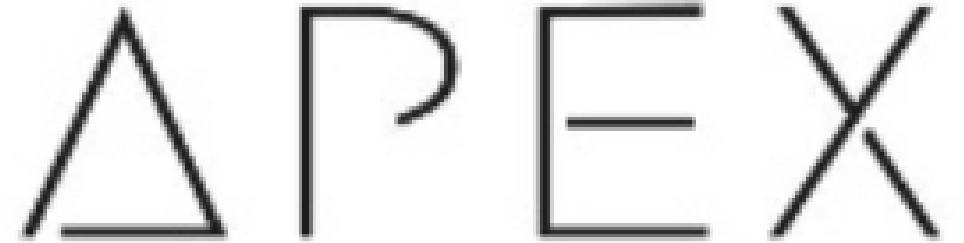
Serverless - Tools

Serverless - Open Source tooling ...

SERVERLESS(.COM)

APEX(.COM)

—   *Open Source project*

Deploy to various Cloud Providers:

- - AWS Lambda
- - Azure
- - Google
- - OpenWhisk
- - Kubeless
- - SpotInst

— 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.

Serverless - Open Source Frameworks

Serverless - Open Source Frameworks
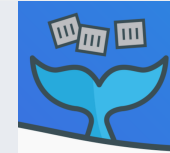
KUBELESS

FISSION

APACHE OPENWHISK

OPENFAAS

FN PROJECT

SPRING CLOUD FUNCTIONS
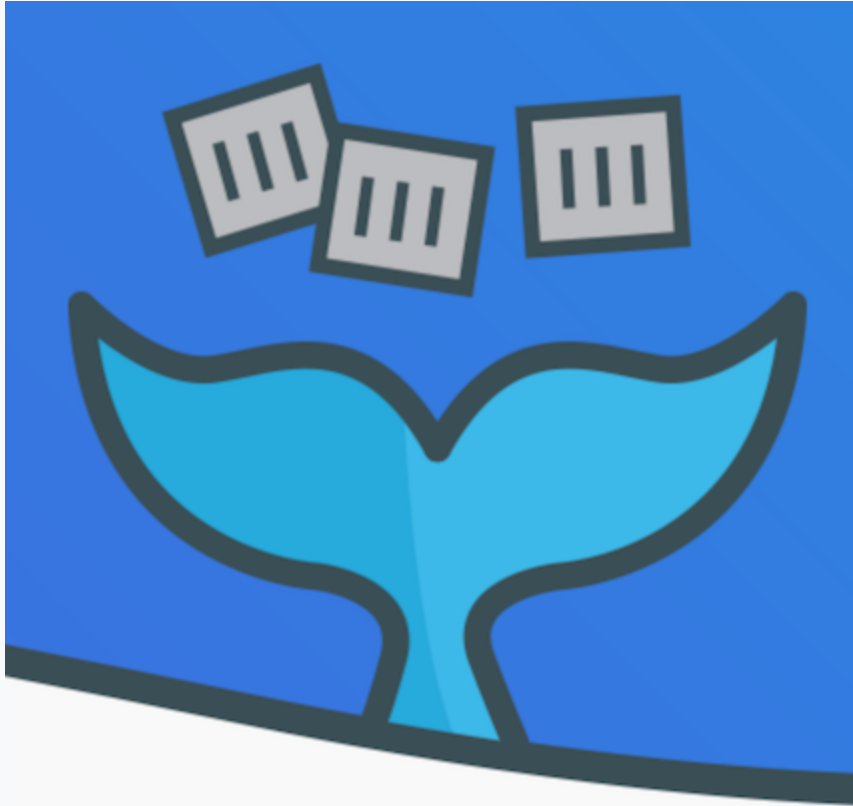
OpenFaaS

- - OpenFaaS runs on Docker-Swarm or Kubernetes
- - FaaS-Netes runs on Kubernetes
- - faas-cli: command-line tool
- - A young project with a vibrant community of volunteers

— *Alex Ellis, Docker Captain*

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] 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	Serverless platform from Bitnami	url
Fission.io	Serverless platform from Platform9	url
Apache OpenWhisk	Serverless platform from IBM	url
OpenFaaS	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 !

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Chalice

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

pip installable module, command-line tool

Lambdify

—

Zappa.io

— *Open sourced by Gun.io - Python/AWS λ*

pip installable module, command-line tool

Can run Django ... serverless (?)