

Serverless & FaaS

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Outline

1. Basics of serverless & FaaS
2. Motivation & Tradeoffs
3. Cloud Providers & Open Source
4. Research & Conferences
5. Future work & resources

Basics of serverless & FaaS

the serverless hype 2018



Elliot Forbes [Follow](#)
Professional Software Engineer.
Dec 31, 2017 · 4 min read

How Serverless Computing will Change the World in 2018

Serverless computing is a fairly new concept that has somewhat exploded in terms of popularity. This is in-part due to AWS' Serverless offering, [AWS Lambda](#) as well as Azure's newly released [Functions](#).



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Google Cloud Next: Ein Rundumschlag für Serverless

Auf der hauseigenen Konferenz Google Cloud Next hat der IT-Konzern eine ganze Reihe von Produkten und Neuerungen im Bereich Serverless Computing vorgestellt.

25.07.2018 12:47 Uhr – Björn Bohn – 32 Kommentare



CLOUD COMPUTING

By [David Linthicum](#), InfoWorld | OCT 9, 2018

Serverless cloud computing: Don't go overboard

The new cry from the big public cloud providers is 'serverless computing for everything.' Don't be fooled

Real-time Data Processing with Serverless Computing

By [Jay Sitapara](#) / October 19, 2018 / [No Comments](#)

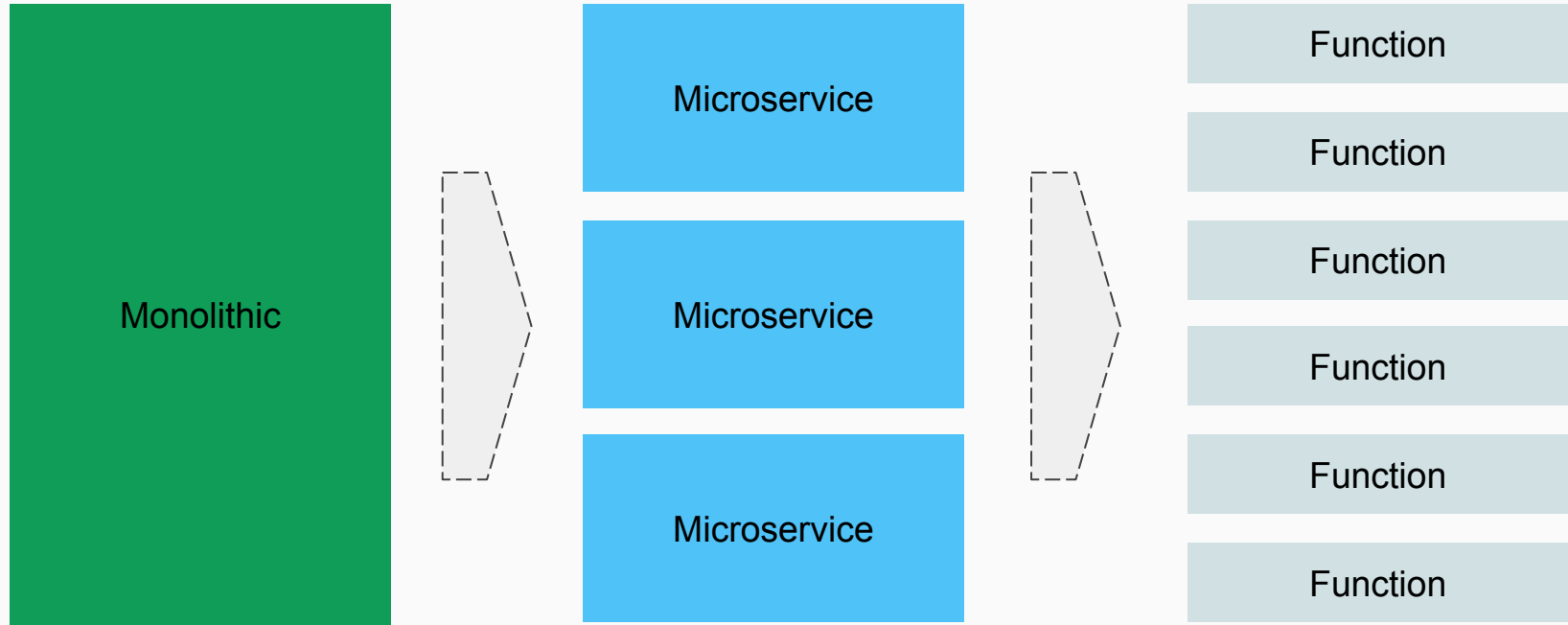


First: What is FaaS?

**“Event-triggered,
stateless compute containers”**

Functions as a Service (FaaS)

Monolithic vs Microservice vs FaaS

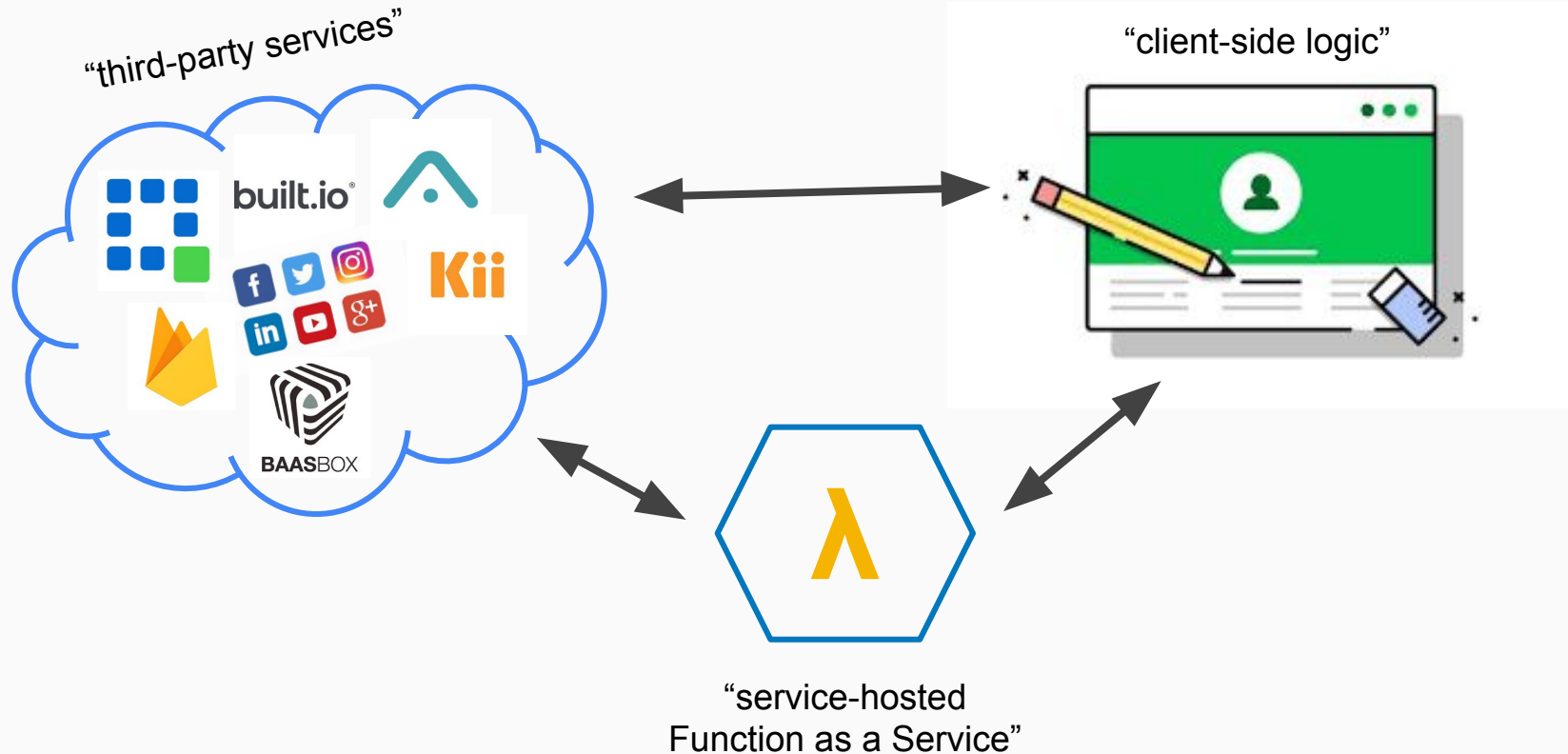


Serverless (Architectures)

“...rely solely on a combination of **third party** services, **client-side** logic and **service hosted** remote procedure calls (FaaS)”

Source: <https://martinfowler.com/articles/serverless.html>

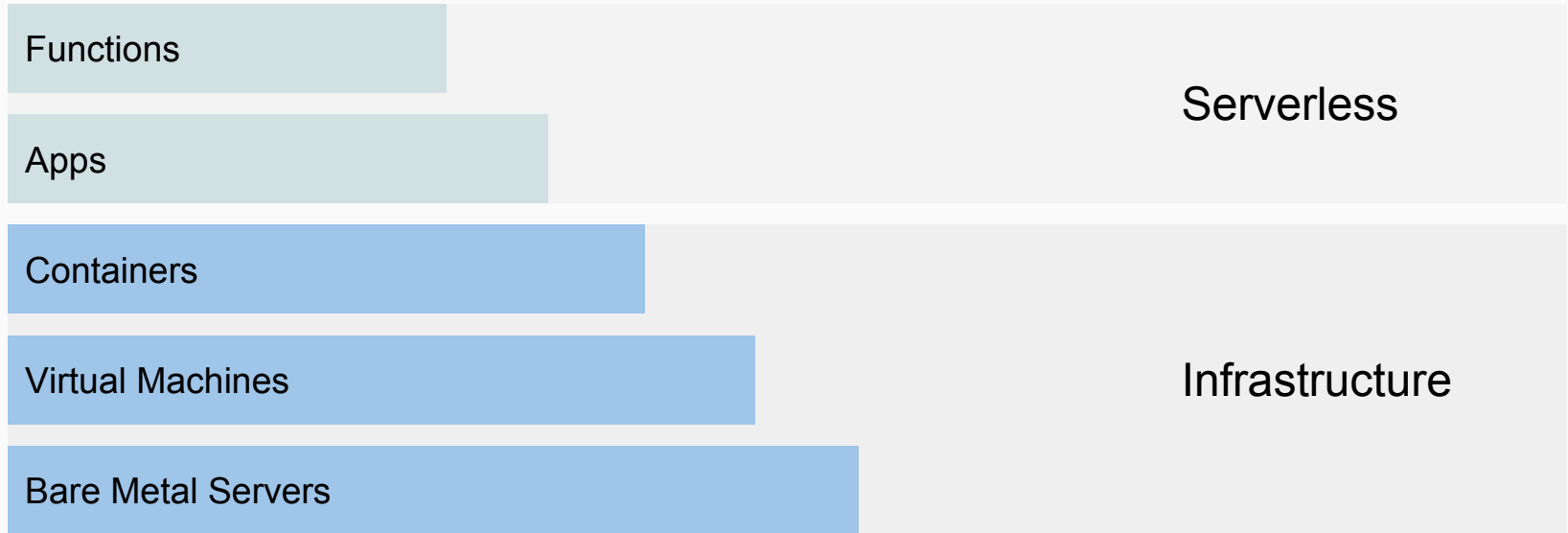
Serverless (Architectures)



Serverless **vs** FaaS

Does it mean the same?

Serverless vs FaaS



Serverless $\neq$ FaaS

Motivation?

IaaS, PaaS, SaaS, BaaS, **FaaS?**

Why yet another “**?** as a Service” ?

Motivation?

“I just want to **focus** on writing **business** logic!”

Motivation?

**“I don’t want to ‘run’ things,
they should just work!”**

Motivation?

“I want to **scale to ‘it works’ !”**

Tradeoffs?

- Vendor Control / Lock-In
- Denial of Service = Denial of Purse
- Stateless
- Maturity
- UX as a Developer

Cloud Providers & Open Source

FaaS at public cloud providers

Amazon Lambda



Azure Functions



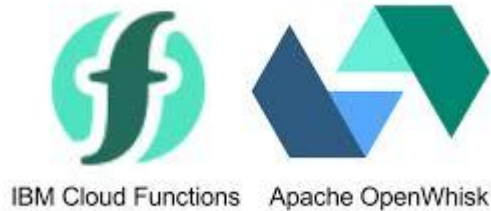
Google Cloud Functions



IBM OpenWhisk on IBM Cloud

Webtask (Auth0)

stdlib

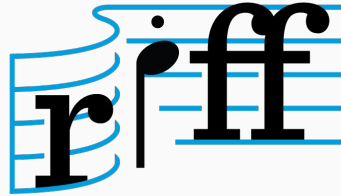


FaaS Open Source

OpenWhisk



riff project



fn



OpenFaaS

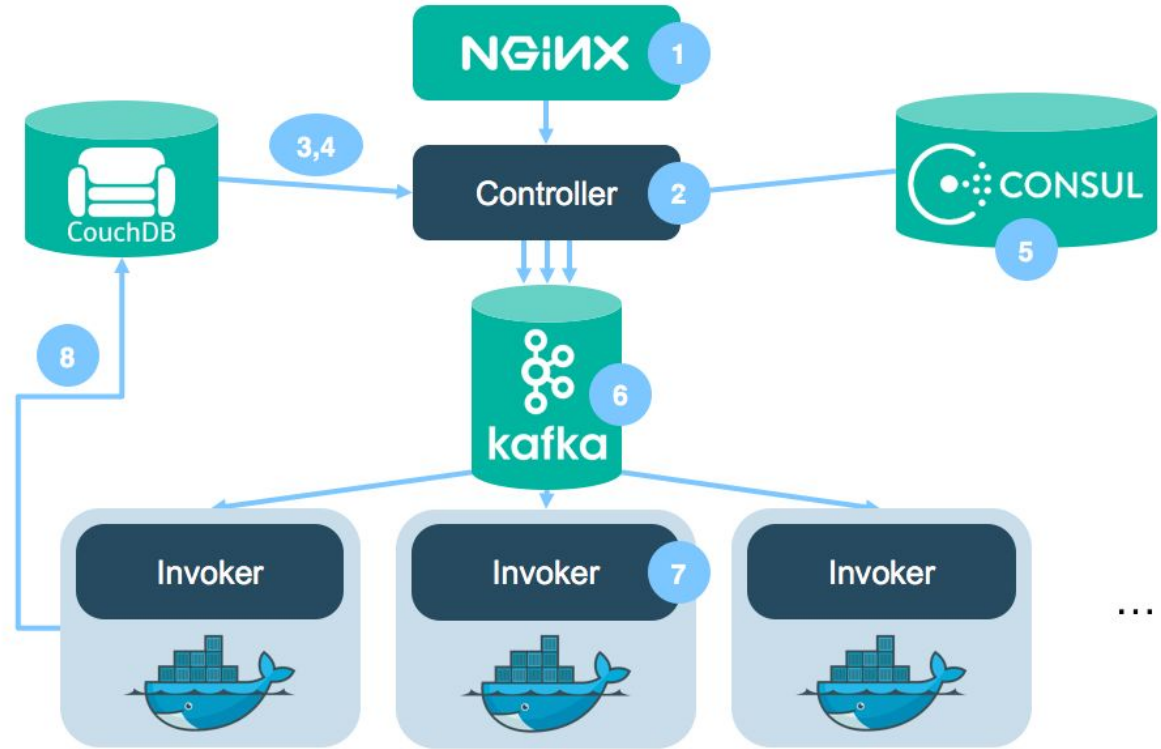


Kubeless



IronFunctions

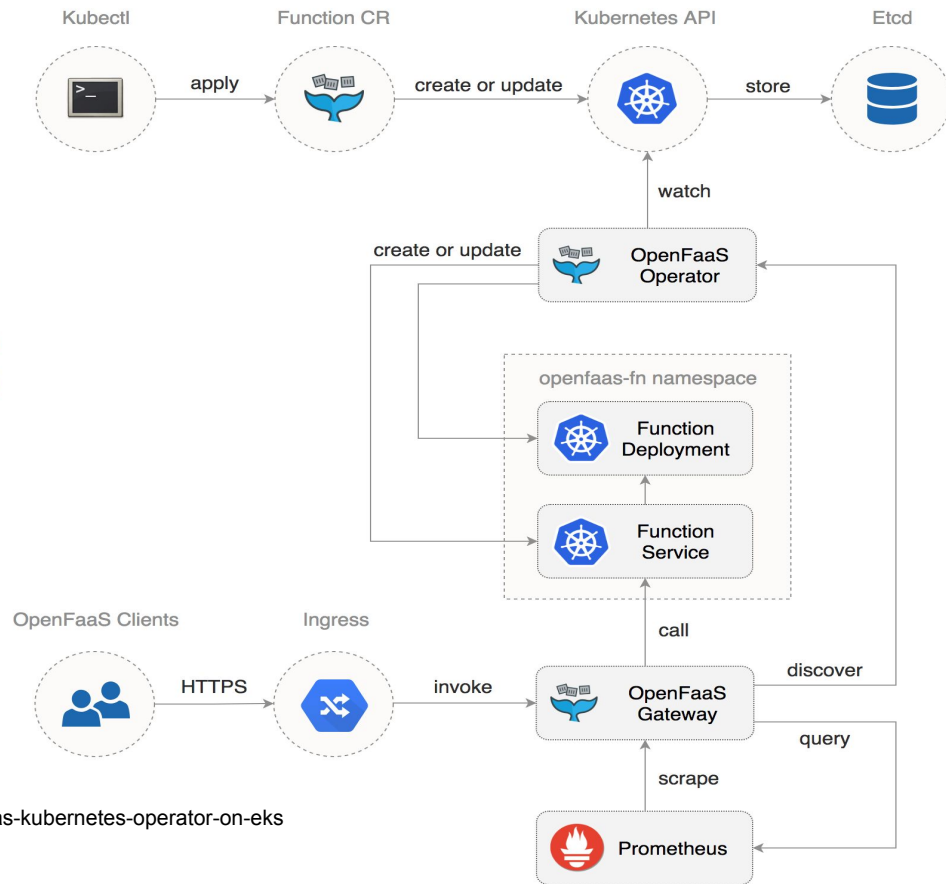




OpenFaaS on Kubernetes



OPENFAAS



Source: <https://www.weave.works/blog/getting-started-with-openfaas-kubernetes-operator-on-eks>

B.Sc. Christian Bargmann, HAW Hamburg | @chrisbargmann

Demo



<https://github.com/cbrgm/kubeless-demo>

Research & Conferences

- **Cost** - minimizing the resource usage of a serverless function (running & idle)
- **Cold Start** - scale to zero, not charging customers for idle time = Cold Start Problems
- **Resource limits** - handle load spikes, manage attack, resource quotas ...
- **Security** - running multiple functions on a shared platform
- **Scaling** - scale functions without knowledge about the app
- **Cross-Cloud** - make functions work across different serverless platforms
- **Legacy-Apps** - access (non)-cloud applications through serverless code
- **Dev-Tools / IDEs** - higher level developer capabilities, debugging serverless code
- **Statefulness** - manage state in stateless, serverless functions
- ...

- **KubeCon / CloudNativeCon**

- <https://events.linuxfoundation.org/events/kubecon-cloudnativecon-europe-2018/>
- 2018, Copenhagen, Seattle
- 2019, May 20-23 Barcelona, Nov 18-21 San Diego

- **Serverless Conference**

- <http://serverlessconf.io/>
- 2018, Paris, San Francisco

- **Continuous Lifecycle**

- <https://continuouslifecycle.london/>
- 2019, May 15-18 London

Research Aspects



Research Aspects



Future work and resources

Future Work

- Future work together with Prof. Dr. Stefan Sarstedt:
Make **serverless available for education**
- Allow students to host their own serverless functions using the **ICC as a FaaS platform** (OpenFaas, Kubeless + Istio...?)

Resources

- https://www.youtube.com/watch?v=_1-5YFfJCqM
Keynote: Serverless, Not So FaaS - Kelsey Hightower, Google
- <https://martinfowler.com/articles/serverless.html>
Serverless Architectures, Mike Roberts, Symphonia
- <https://azure.microsoft.com/en-us/overview/serverless-computing/>
Serverless Computing - Take your mind off infrastructure and build apps faster

References

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Thanks!

Feel free to ask question!

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