

Containerising Functions using Docker and OpenShift

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The FaaS Space



AWS Lambda



Google Cloud Platform
Functions



OpenWhisk



Azure

Webtask.io

Hook.io

PyWren

Zappa

Serverless Framework



Funktion

Kubeless

Fission

Picasso

Effe

Docker-LambdaCI

OpenLambda

Lever OS

X-Ray

Step Functions



The FaaS Space

Function-as-a-Service offerings in greater detail...

Implementation	Languages	Availability
AWS Lambda	Node.js, Java, Python / C#	Service
Google Cloud Functions	Node.js	Service
IBM/Apache OpenWhisk	Node.js, Swift, Docker* / Python	OSS + Service
Azure Functions	Node.js, C# / F#, Python, PHP, ...	Service
Webtask.io	Node.js	OSS + Service
Hook.io	Node.js, ECMAScript, CoffeeScript	OSS + Service
Effe	Go	OSS
OpenLambda	Python	Academic + OSS
LambCI Docker-Lambda	Node.js	OSS (re-engineered)
Lever OS	Node.js, Go	OSS
Fission	Node.js, Python	OSS
Funktion	Node.js	OSS
Kubeless	Python	OSS

Trend: Sooner or later → gaps will be filled

FaaS Research Questions

We spend your tax money on figuring out:

- Characteristics (technical, economical)
- Engineering applications (debugging, profiling, autotuning)
- Migrating legacy code bases (static vs. dynamic code analysis)
- Hybrid technology applications, compositions
- Tools to make all that happen

Some Fun at First

“Lambbackup“

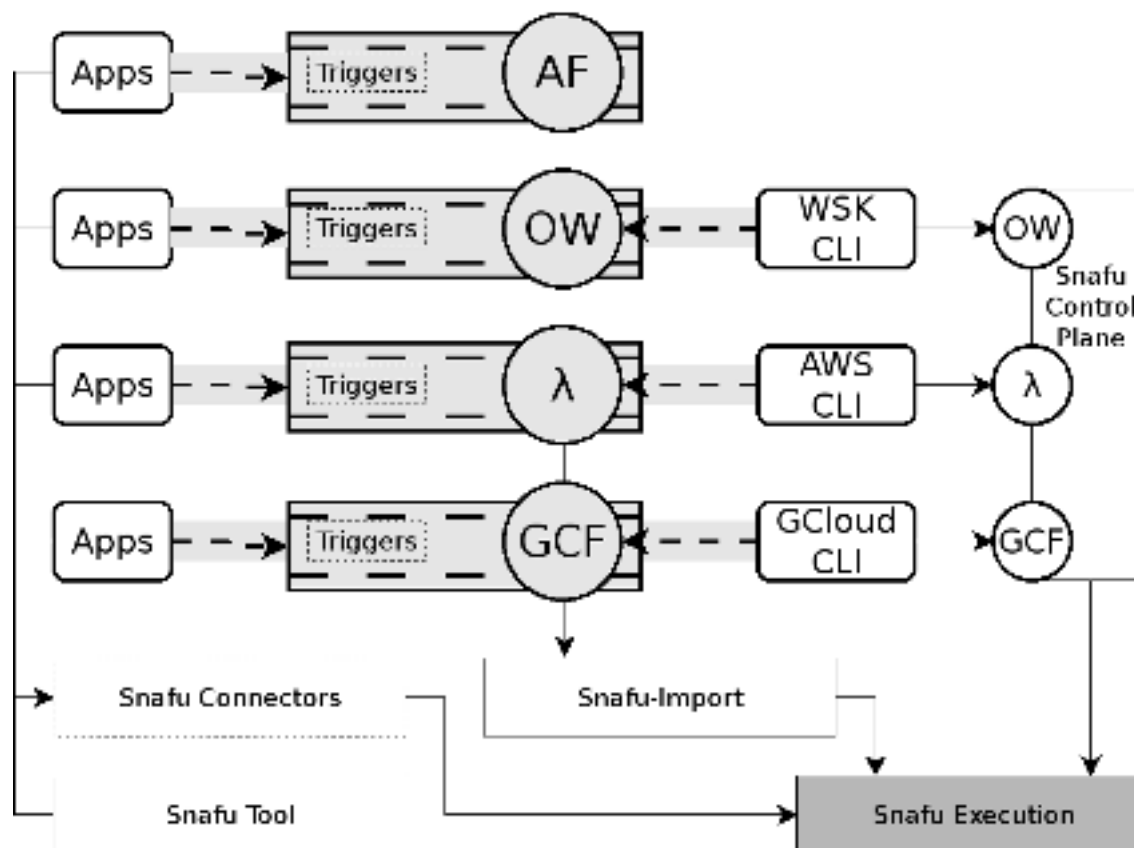
```
$ ./lambbackup list
1 files found with records.
refdata/Apache-2.0
$ ./lambbackup backup .gitignore
Prepared 1 chunks. Backup ...
.
Updating file list.
Backed up .gitignore.
$ ./lambbackup list
2 files found with records.
refdata/Apache-2.0
.gitignore
```

“Lambda Worms“

```
import boto3
import time

def lambda_handler(event, context):
    time.sleep(context.get_remaining_time_in_millis() / 1000.0 - 1)
    c = boto3.client("lambda")
    c.invoke(FunctionName="worm", Payload="{}")
```

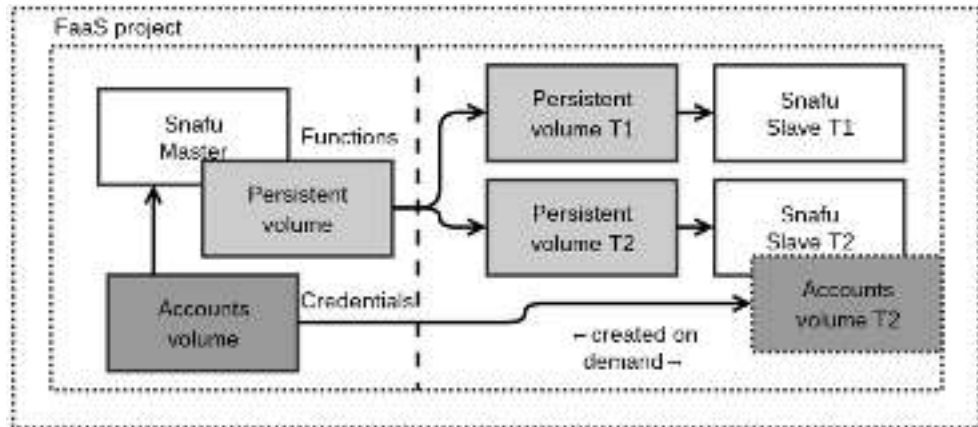
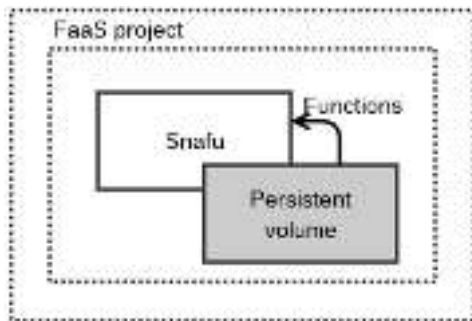
Snafu: Swiss Army Knife of Serverless Computing



FaaS in PaaS: Architectural Choice

Choices:

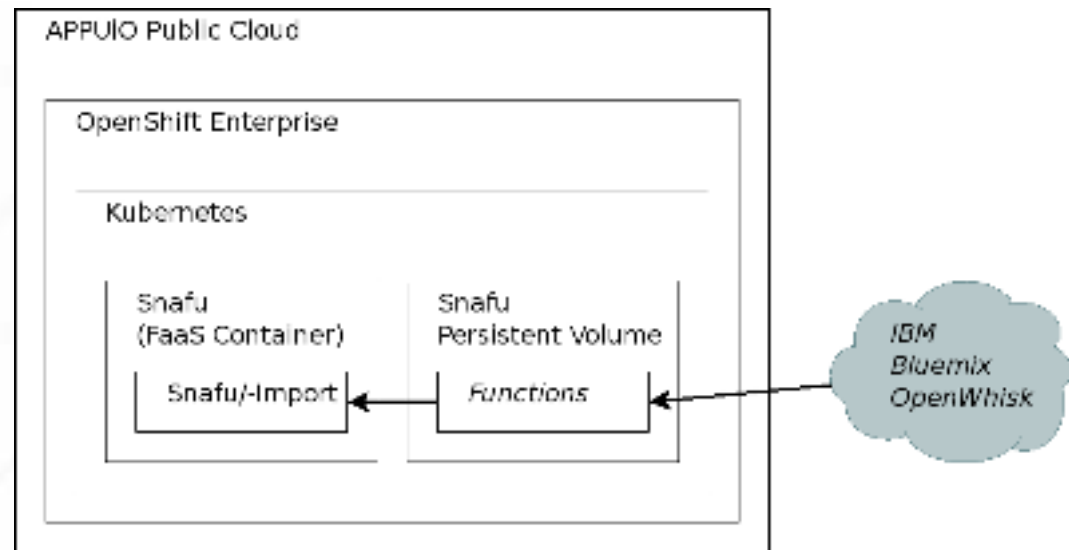
- unprivileged (single-tenant Docker instance)
 - any user hosts functions
- semi-privileged (Open Service Broker API)
 - provider hosts functions (could be external)
- privileged (deeply integrated as Kubernetes/OpenShift resources)
 - provider hosts functions



Demo Scenario

Credits

Promotion ID	Expires ^	Promotion value	Amount remaining
Free Trial	11 Mar 2015	\$300.00	Expired
Google Cloud Platform Credit	10 Jan 2016	\$5,000.00	Expired
Sales Credit	12 Apr 2017	\$10,000.00	Expired

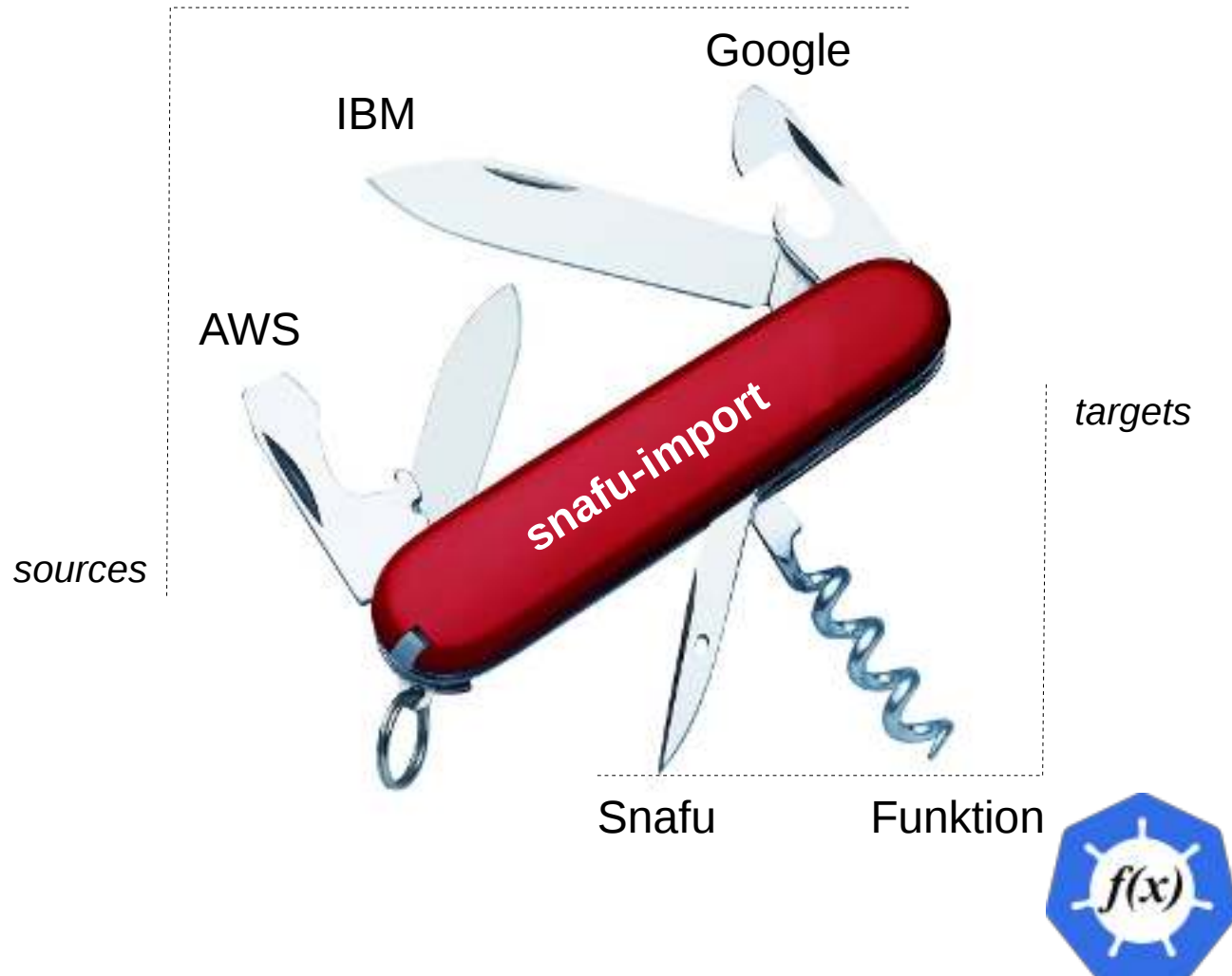


Demo Time - Make it or break it!



[thetalentcode.com]

One More Thing...



OK, Demo Again...



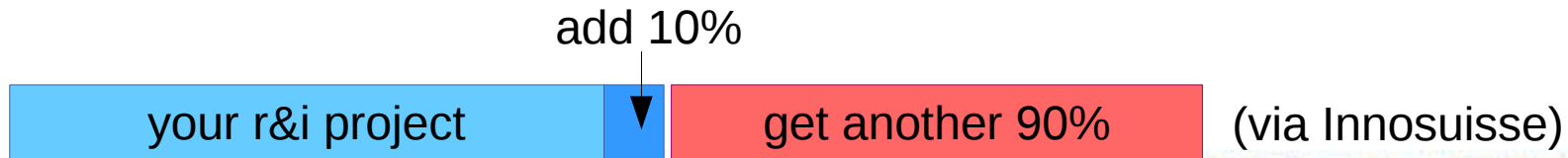
**KEEP
CALM
IT IS
DEMO
TIME**

[keepcalm-o-matic.co.uk]

Service Prototyping Lab

Research approach

- ambitious long-term research initiatives
 - cloud-native applications, **service tooling**, cloud accounting & billing
- transfer of results into Swiss companies



Publishing approach

- preprint-first - rapid dissemination
- open source, Labsite
- blog posts, events


Future Cloud Applications

Thu, April 27, 18:30 @ Technikum Winti - All technical details about Snafu & Lambada

The screenshot shows a Meetup page for the group 'Future Cloud Applications'. The page has a red header with the group name. Below the header is a navigation bar with links for Home, Members, Sponsors, Photos, Pages, Discussions, and More. On the right side of the navigation bar are links for Group tools and My profile. The main content area is divided into three columns. The left column features a profile picture of a cloud with gears, a location of Winterthur, Switzerland, and a list of statistics: 47 Members, 1 Upcoming Meetups, 1 Past Meetups, and Our calendar. The middle column has a 'Welcome!' section with a 'Schedule a new Meetup' button, an 'Upcoming (1)' section with links for Post and Calendar, and a featured event titled 'More on FaaS: The Swiss Army Knife of Serverless Computing' by ZHAW. The event is scheduled for Thursday, April 27, at 6:30 PM, with 7 days left. The right column is titled 'What's new' and lists several new members who have joined the group, including Lucia Lehmann, Peter Unzer, Robert Brem, and Benji.

Future Cloud Applications


Home Members Sponsors Photos Pages Discussions More Group tools My profile


Change photo

Winterthur, Switzerland
Founded Feb 7, 2017

About us...

Invite friends

Members	47
Upcoming Meetups	1
Past Meetups	1
Our calendar	


Welcome!

[+](#) Schedule a new Meetup

Upcoming (1) Post Calendar

More on FaaS: The Swiss Army Knife of Serverless Computing

ZHAW
Technikumstr. 9, building TH-043, Winterthur (map)



ZHAW's Service Prototyping Lab presents more prototypes in the area of Function-as-a-Service (FaaS), both for AWS Lambda and for other target environments. Among the...

[Learn more](#)

Hosted by: JS IOrganizer!

Thu Apr 27
6:30 PM

I'm going

7 days left

8 going

0 comments

Recent Meetups

February 23 - 8:00 PM [Rate this Meetup](#)

What's new

NEW MEMBER
Lucia Lehmann joined
April 13

NEW MEMBER
Peter Unzer joined
April 12

NEW MEMBER
Robert Brem RSVP'd Yes for More on FaaS: The Swiss Army Knife of Serverless Computing
April 10

NEW MEMBER
Robert Brem joined
April 10

NEW MEMBER
Benji joined
March 28

NEW MEMBER
Roman joined
March 28

Further Reading and FaaS Fun

Lama, Lambbackup:

- <https://arxiv.org/abs/1701.05945>

Podilizer:

- <https://arxiv.org/abs/1702.05510>

Snafu:

- <https://arxiv.org/abs/1703.07562>

On arXiv Analytics:



On GitHub:



[github.com/serviceprototypinglab]

