

Cloudware and Beyond: Engineering Methods and Tools

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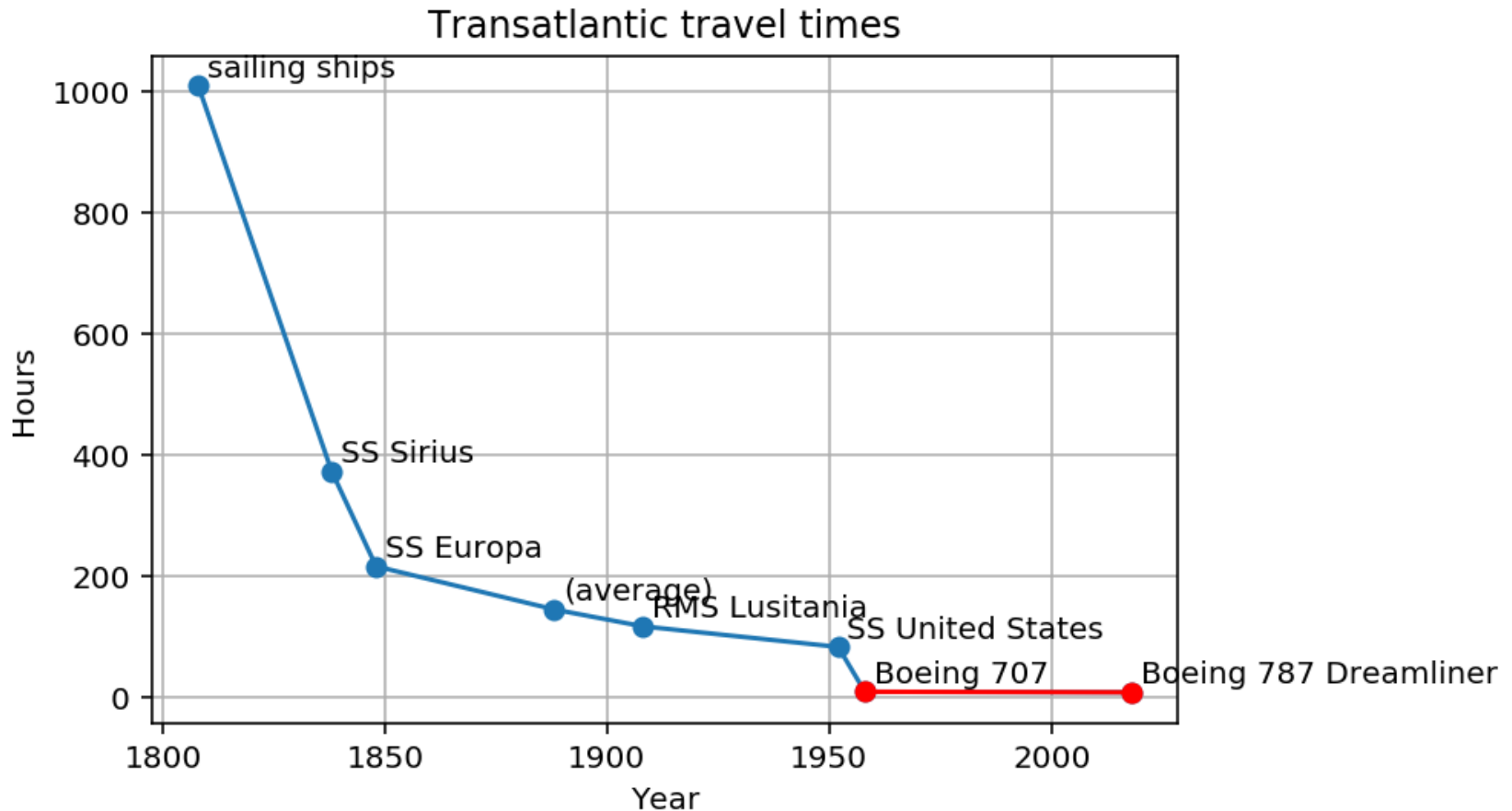
The Double Link between CC and SS



utility computing concept
defined by technology



Technological Irrelevance in Numbers



And now to: Cloud Computing



What the **** is Cloud Computing? (And how do we write software for it?)

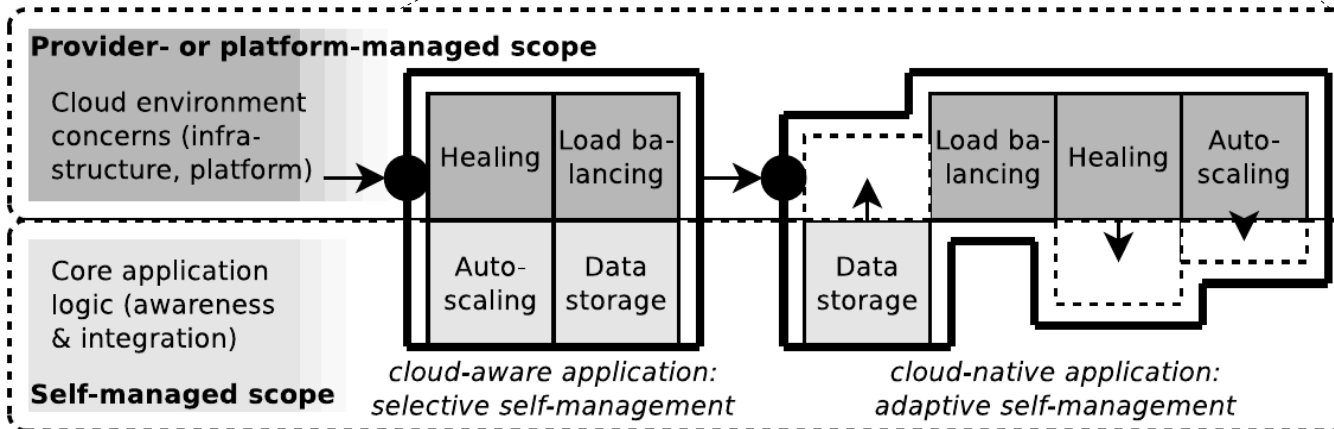
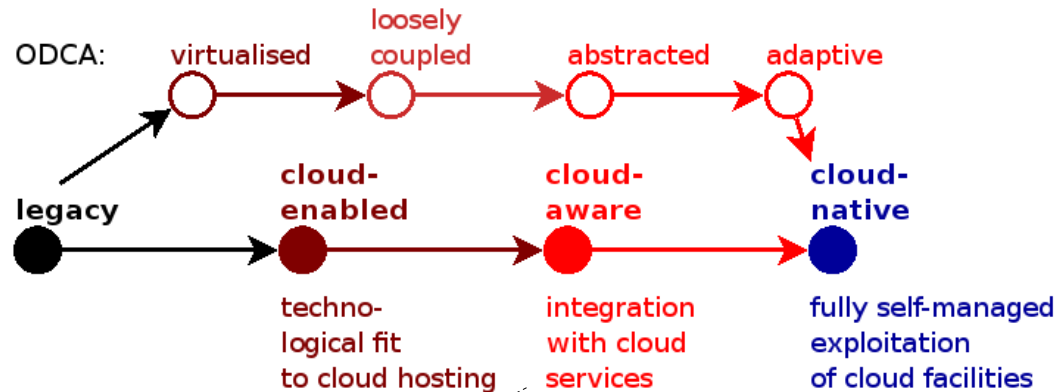
Let us ask some smart people...



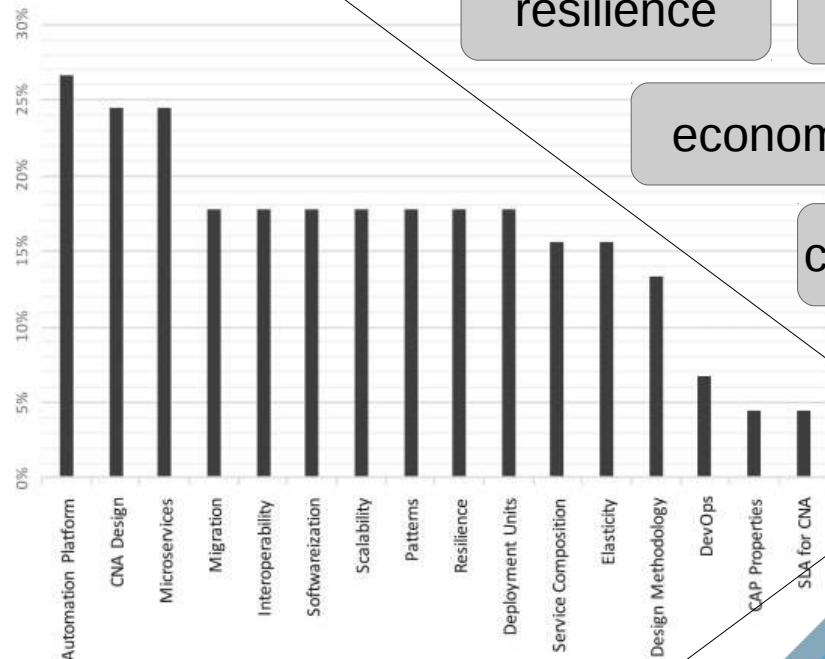
[edujobscanada.com]



Cloudware and Cloud-Native Apps



CNA Engineering Methods and Tools



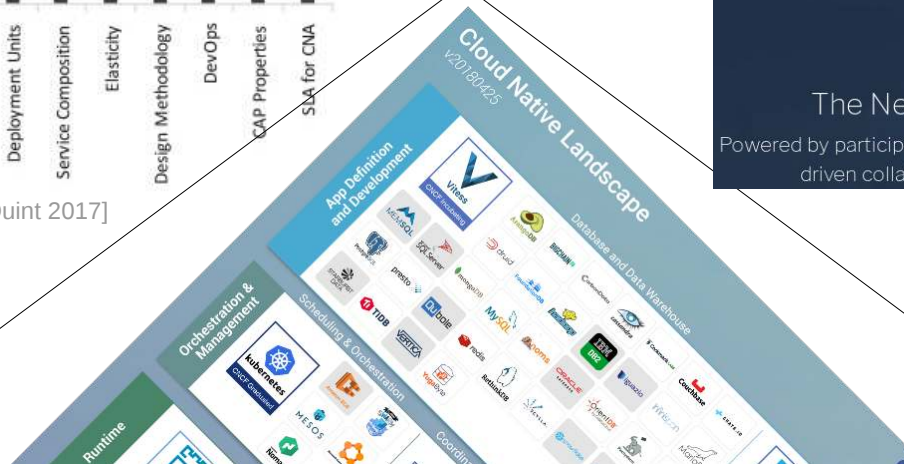
[Kratzke & Quint 2017]

WELCOME TO OPENSIFT.IO

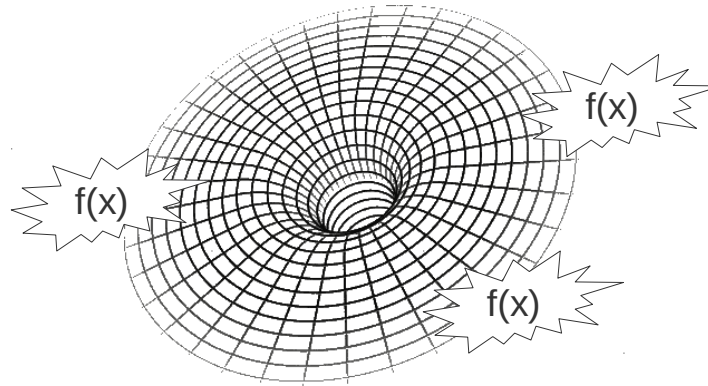
OpenShift.io is an open online development environment for planning, creating, and deploying hybrid cloud services.

Jakarta EE

The New Home of Cloud Native Java
Powered by participation, Jakarta EE is focused on enabling community-driven collaboration and open innovation for the cloud.

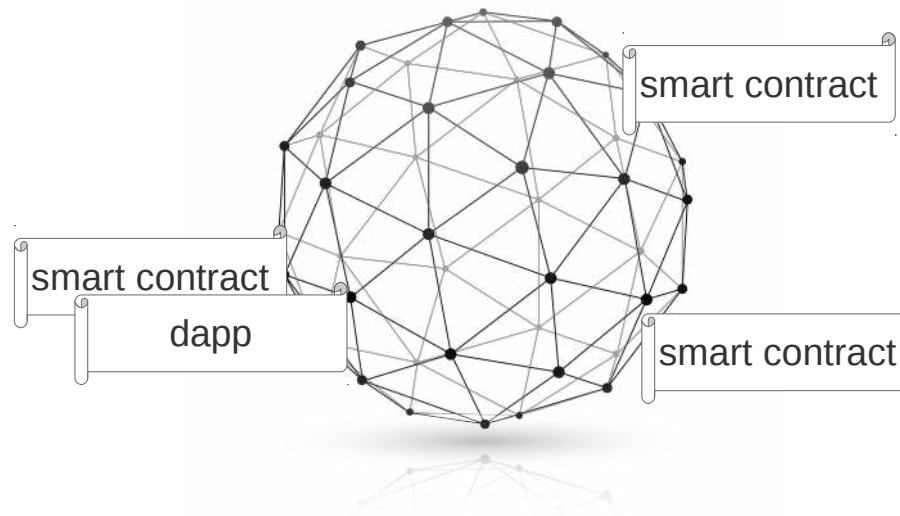


Beyond Clouds: The Post-Cloud Era



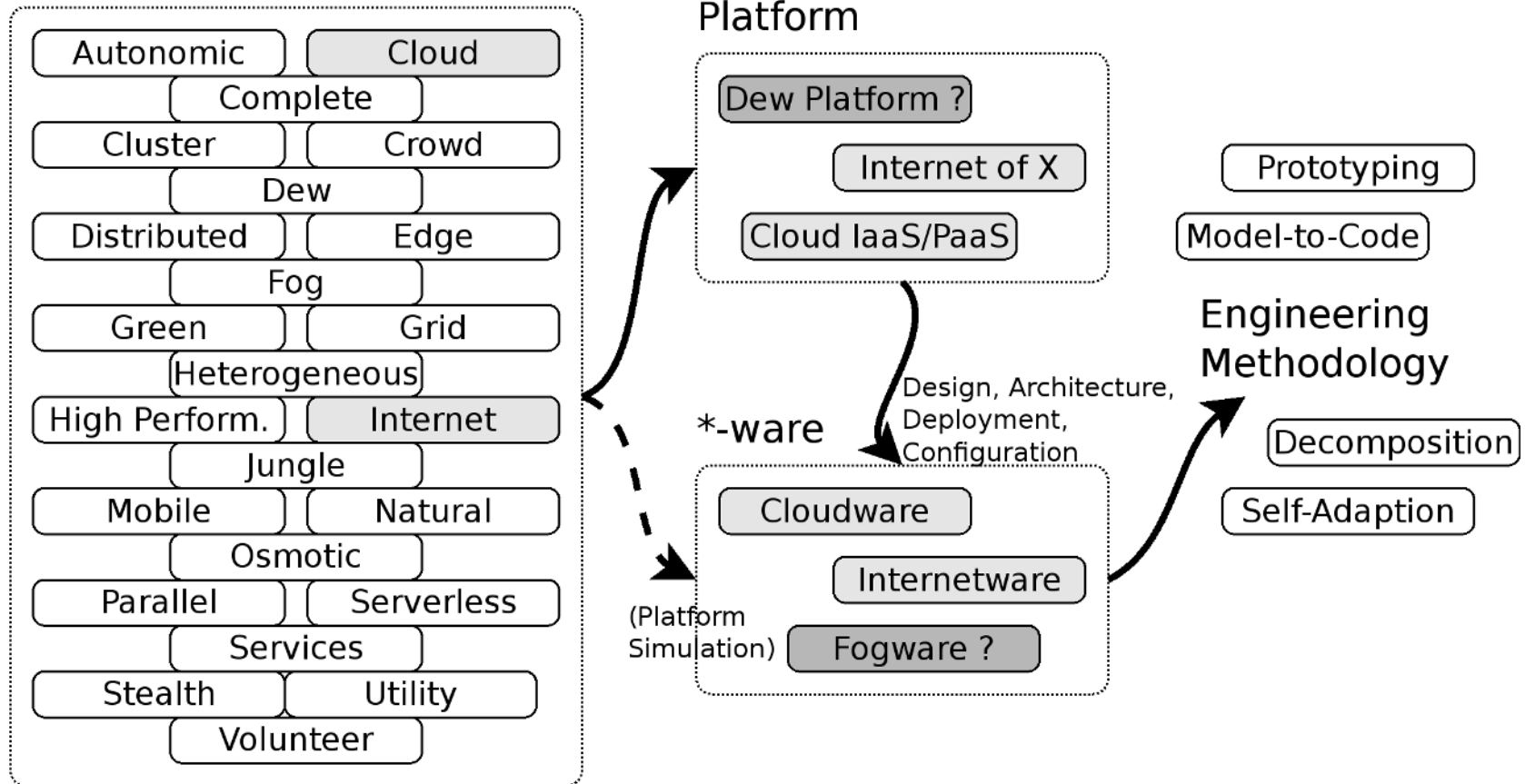
“THE CLOUD REVOLUTION IS DEAD”

[Wired, 2013]

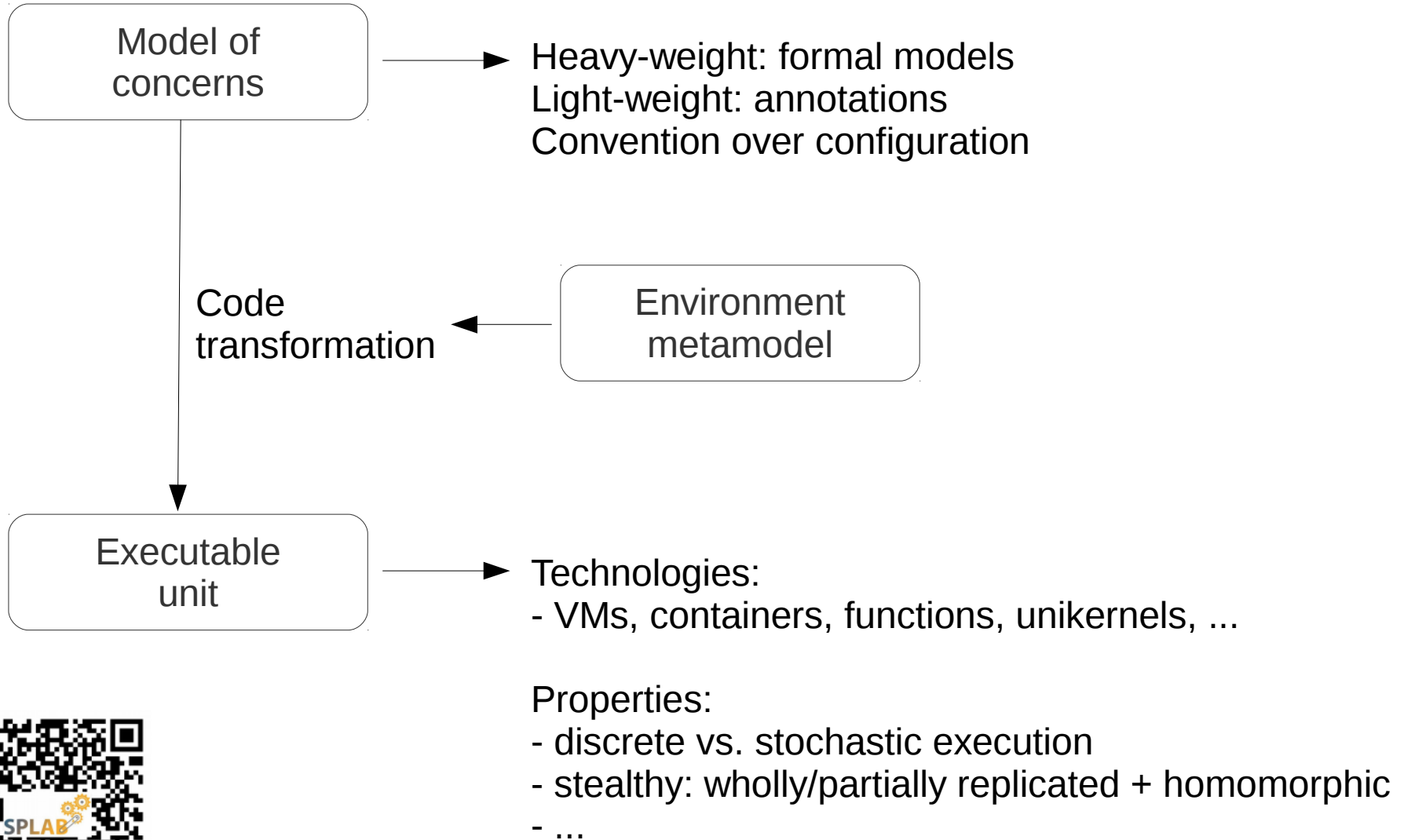


* Computing Trends: Systematic View

Paradigm: * Computing



*-ware Engineering Trends

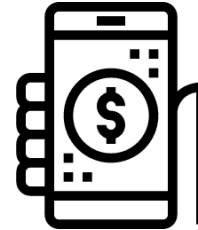


Our Contributions for Switzerland

Service Prototyping Lab @ ZHAW

Independent and neutral unit for succeeding in the cloudware business

Advanced cloud-native application designs and architectures



Gift Voucher

Value: infinite



To: Your company

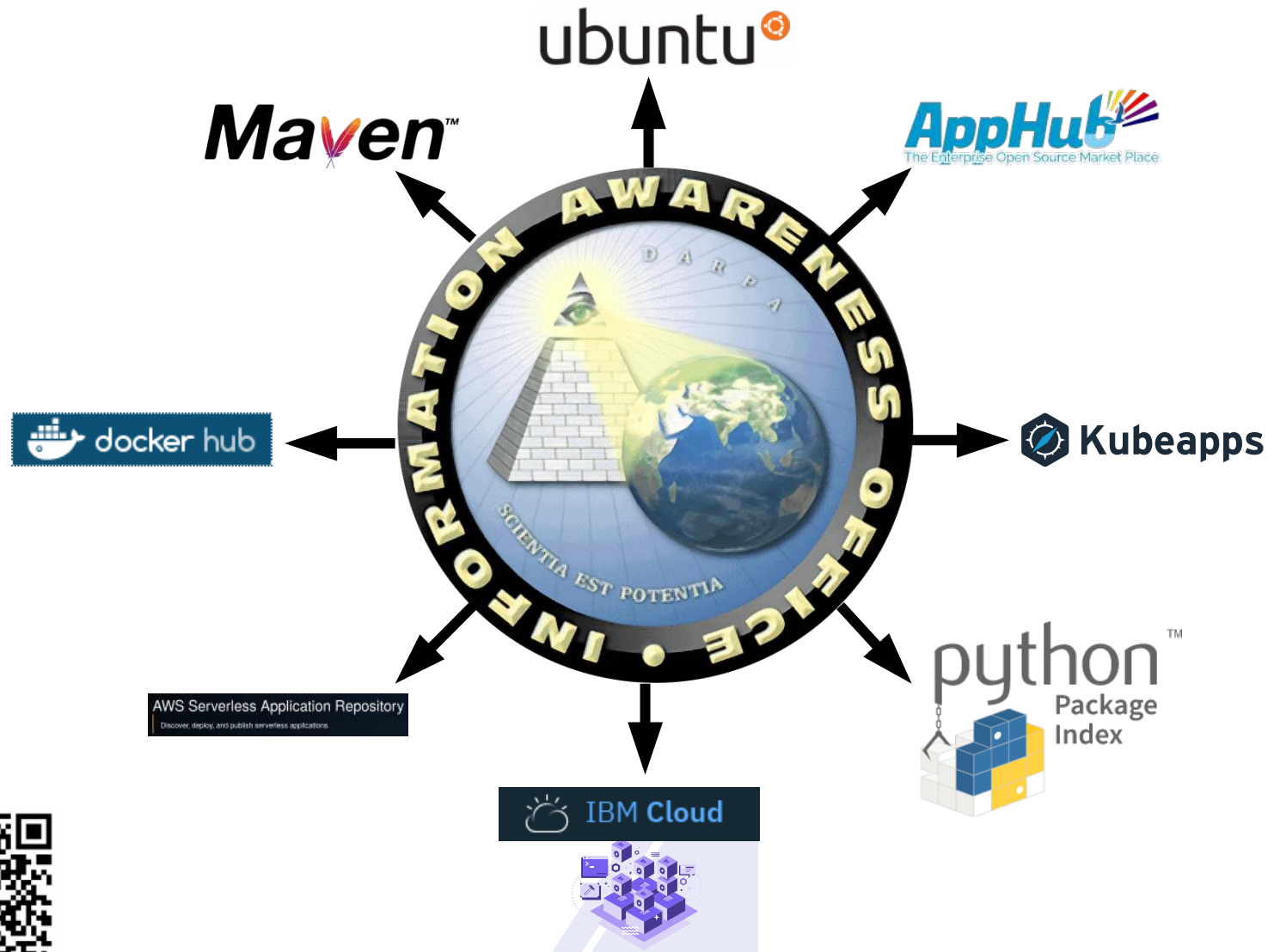
From: SPLab

For:

Innovate with us through joint work!

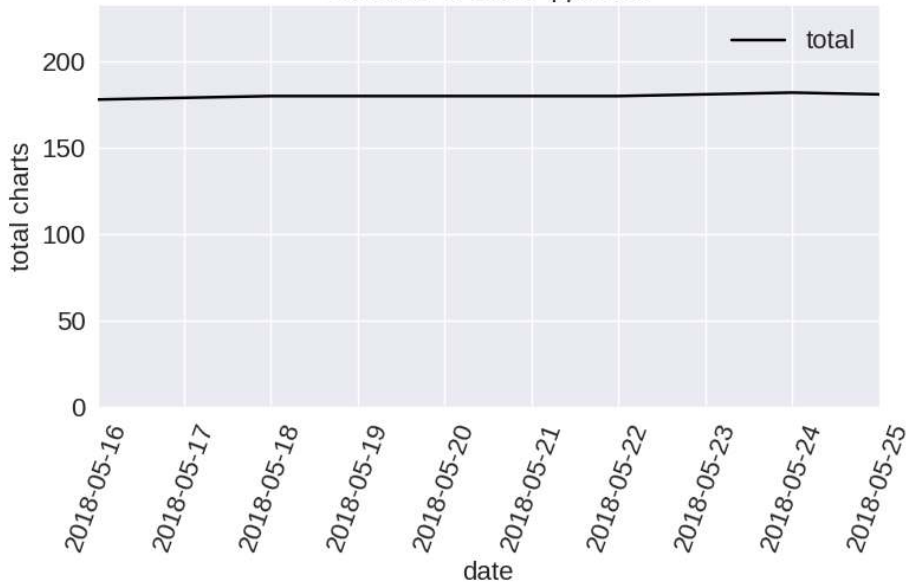


Ecosystem Tracking

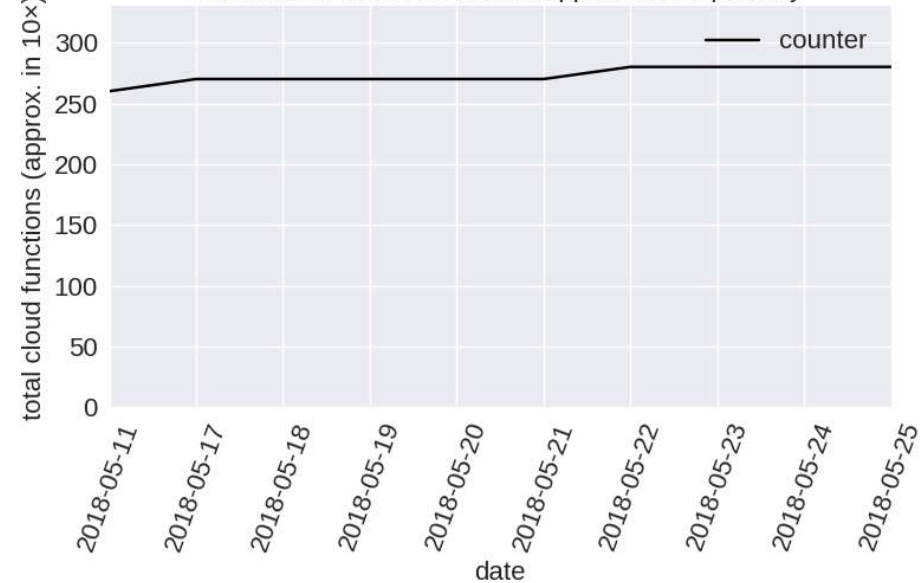


Ecosystem Tracking - Prelim Statistics

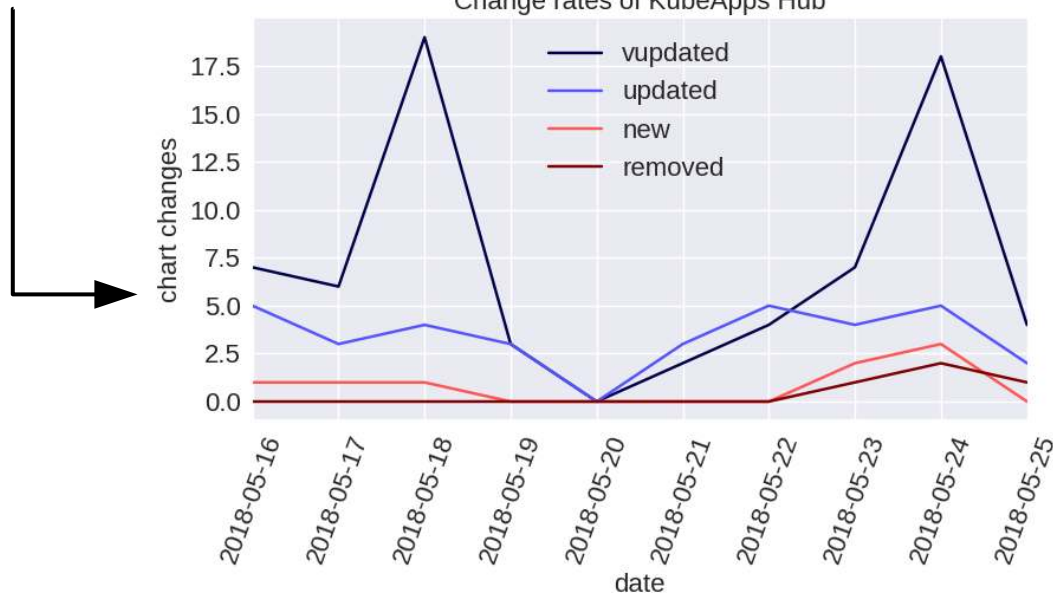
Evolution of KubeApps Hub



Evolution of AWS Serverless Application Repository



Change rates of KubeApps Hub



Ecosystem Participation



beaten by
49 days
in 2018

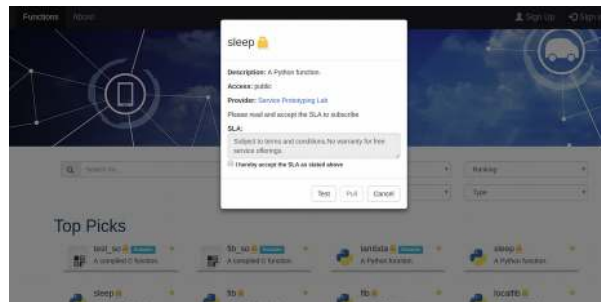
Jan

Mo.	Di.	Mi.	Do.	Fr.	Sa.	So.
25	26	27	28	29	30	31
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4

Feb

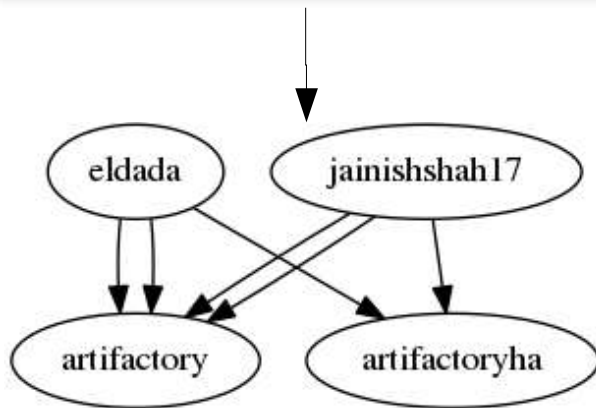
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19	20	21	22	23	24	25
26	27	28	1	2	3	4
5	6	7	8	9	10	11

SPLab's
Function Hub
Prototype



<http://functionhub-zhaw-test1.appuioapp.ch/>

Ecosystem Quality Assurance



Name	Size
artifactory	1 Folder, 4 Files
templates	12 Files
NOTES.txt	1.5 KiB
_helpers.tpl	2.1 KiB
artifactory-deployment.yaml	2.0 KiB
artifactory-pvc.yaml	757 B
artifactory-service.yaml	633 B
nginx-deployment.yaml	1.7 KiB
nginx-pvc.yaml	715 B
nginx-service.yaml	769 B
postgresql-deployment.yaml	1.9 KiB
postgresql-pvc.yaml	736 B
postgresql-secret.yaml	475 B
postgresql-service.yaml	615 B
.helmignore	333 B
Chart.yaml	553 B
README.md	6.4 KiB
values.yaml	2.8 KiB



Software Tools for Swiss Companies

Snafu

manage & run your cloud functions

Helm QA

improve your Helm charts

Sentinel

monitor your cloud applications

Transducer

turn OpenAPI specs into prototypes

OS2OS

Volume2Volume

migrate your OpenShift/Kubernetes apps

Podilizer

Termite

Lambada

transform legacy code into cloud functions

CNDBbench

benchmark cloud database options for your apps

ARKIS Microservices

Functions Collection

*some best practices reference code
for containerised + serverless microservices*



Attention: Cool Demos Outside!

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Informationstechnologie

Cloud Accounting & Billing (CAB)

Enabling sustainable cloud services

Key aspects

- CNA compliant design
- Architected for thorough audits
- Ready for up and coming deployment models
- Flexible model-based operations
- Support for subscription, PAYG models
- Minimal self-operating cost footprint
 - Ideal for micro-billing requirements
 - Suitable for EdgeFog + IoT use-cases
 - Distributed data management layer

Questions to be answered



- What are the relevant billable metrics for an IoT application with EdgeFog deployment model?
- How can emerging paradigms such as FaaS be used to minimize self cost?
- How does one balance the competing requirements of multi-step aggregation heavy data transmission strategy with fine-grained auditability requirements of invoice-bill data from the regulators / users?
- Will secure ledgers become a key enabler technology for our auditability problem?

Reference Architecture: Salient Features

- Designed for large scale deployments yet suitable for simple cloud applications too
- Immediate / Batch mode processing repeatably enabling variety of use-cases
- Aggregation close to data source minimizes data volume in-flight
- Append only blocks for tracking every data transformation securely

Contact

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Are Your Applications Cloud-Native?

Cloud-Native Applications is one of the research initiatives in the Service Prototyping Lab. CNA supports software developers to migrate their legacy applications into the cloud and to create new applications designed for the cloud. Several open source prototypes and successful transfers to Swiss companies could already be achieved.

Objectives of the Initiative

- architectures, patterns and design guidelines for CNA
- recommendations for operation of CNA (self-management, continuous delivery)
- economic guidelines and best practices for microservice compositions
- support of SMEs to build their own cloud-native solutions or re-engineer and migrate existing applications to the cloud

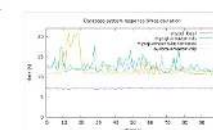
Recent Results

- quantitative assessment of elastic scaling characteristics
- comparison of cloud-native database services and self-hosted databases
- comparison of multi-tenancy models for data-driven microservices
- API integration for cloud services

Showcase: Document Management in the Cloud

- containerized business application
- allows for rolling updates, resilience and scalability
- deployment via Docker-Compose on Kubernetes cluster
- predictable horizontal scaling of microservices

Cloud-Native Applications


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Cost-Saving Tools for App Engineers

The Service Tooling research initiative of the Service Prototyping Lab explores novel tools which assist in the launch of new cloud applications and services. The initiative identifies tools and platform services which are straightforward to deploy, easy to use and generic enough to be re-usable in many service scenarios. We cover the entire app lifecycle.

Objectives of the Initiative


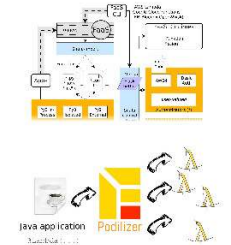
- tools for Serverless / Function-as-a-Service: code decomposition, testing, local execution and migration of functions
- cloud ecosystem tools, e.g. application-level incident management
- stealth computing and other advanced computing paradigms - support Swiss SMEs with leading edge tools and services for cloud applications

Recent Results

- Snafu: execute functions from AWS Lambda, IBM Bluemix, Google Cloud Functions, Azure Functions, ...
- Lambdaic: migrate Python apps into AWS Lambda
- Inroflux: self-learning application behaviour analysis based on long-term checks

Showcase: Podlizer/Termite

- split legacy Java apps into serverless units with Podlizer
- use annotations to control the deployment with Termite
- automate the engineering of composite microservice apps
- open source Java tools with clear business benefits


Cloudware Action in Zurich

December 17-20



December 21



Bookmark: ucc-conference.org & essca2018.servicelaboratory.ch

