Getting started fast

Development infrastructure, CI, and test deployment via a Kubernetes cluster on AWS

Jörg Müller (@joergm) and Andreas Krüger, September 2017

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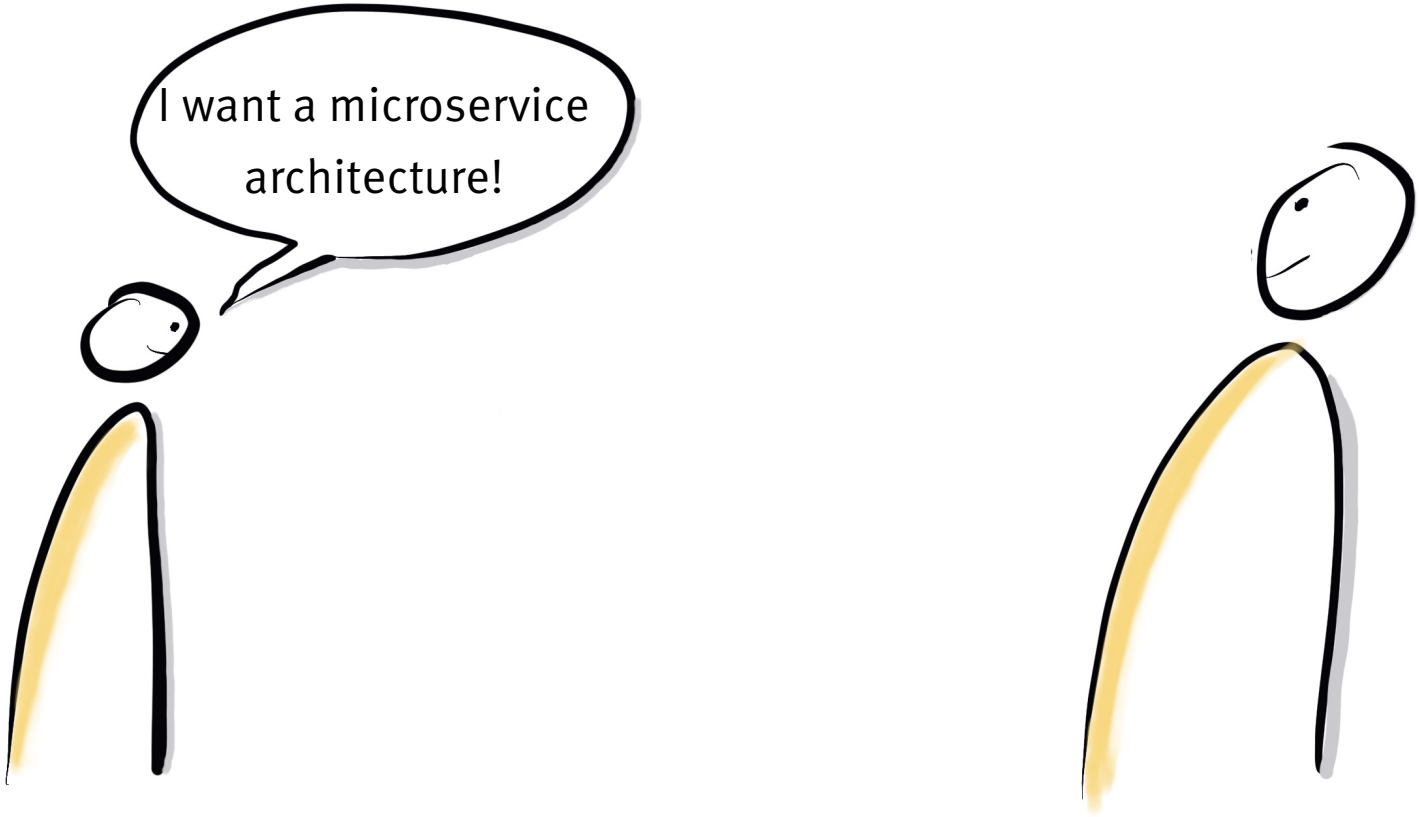
Typical client situation



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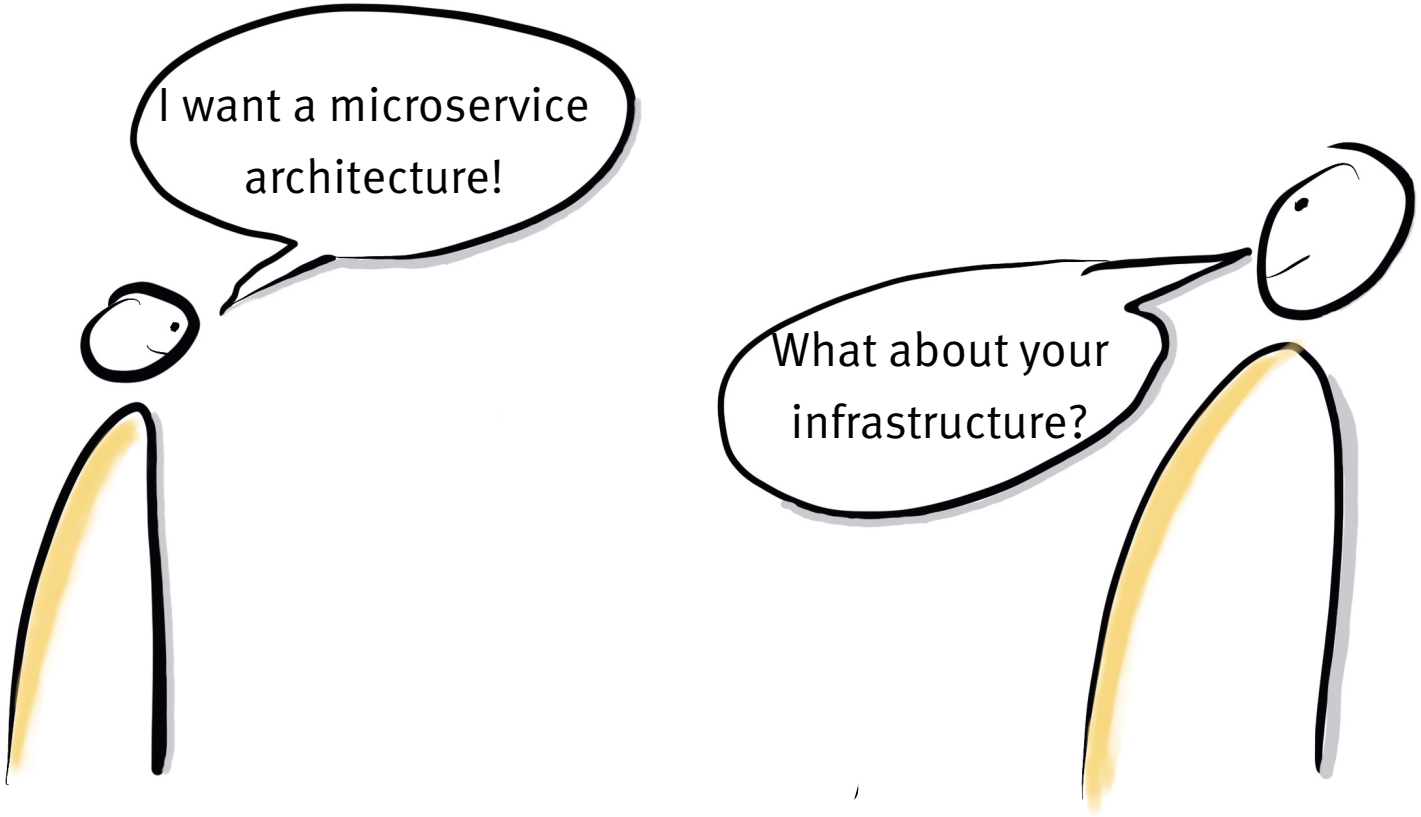
Typical client situation



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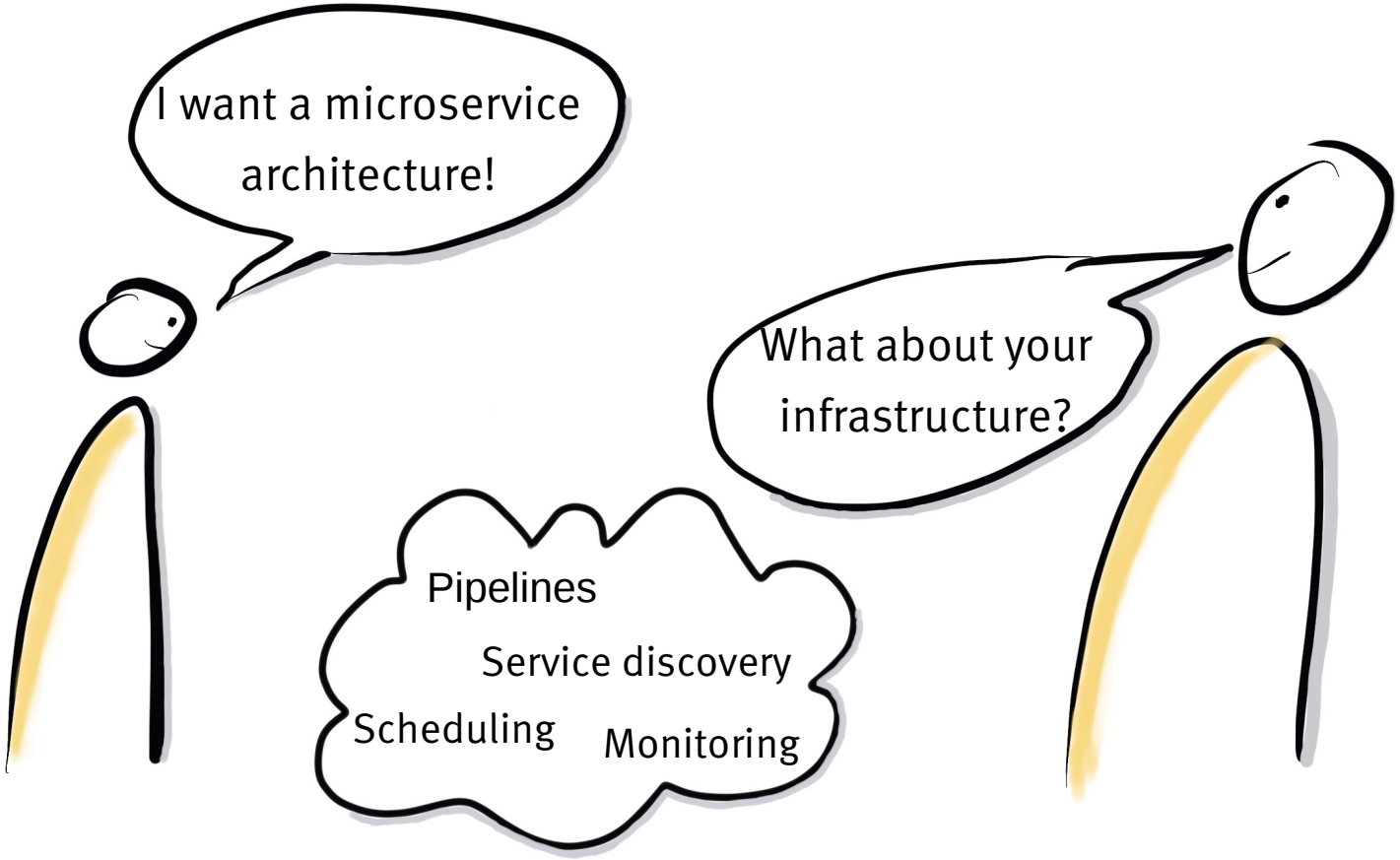
Typical client situation



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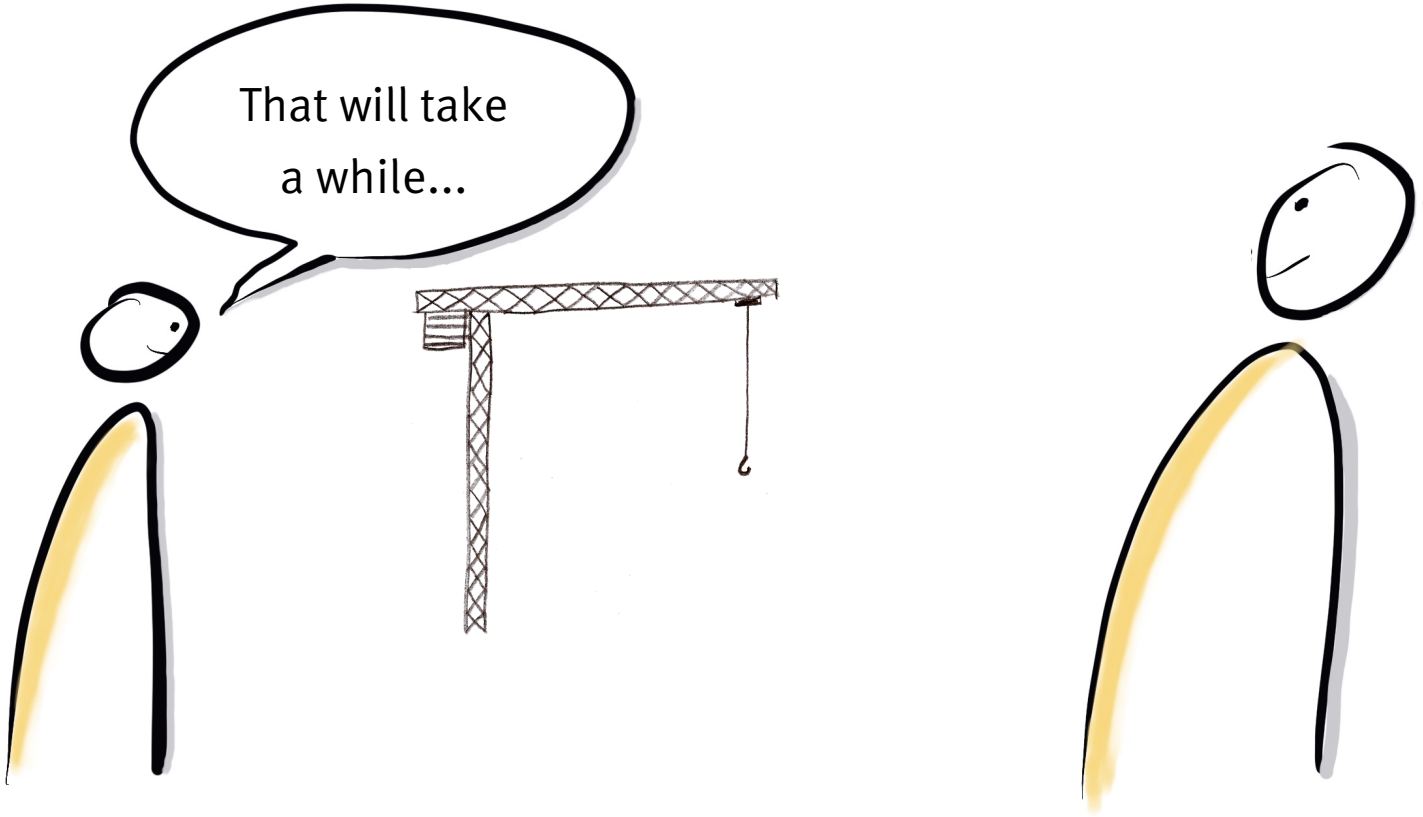
Typical client situation



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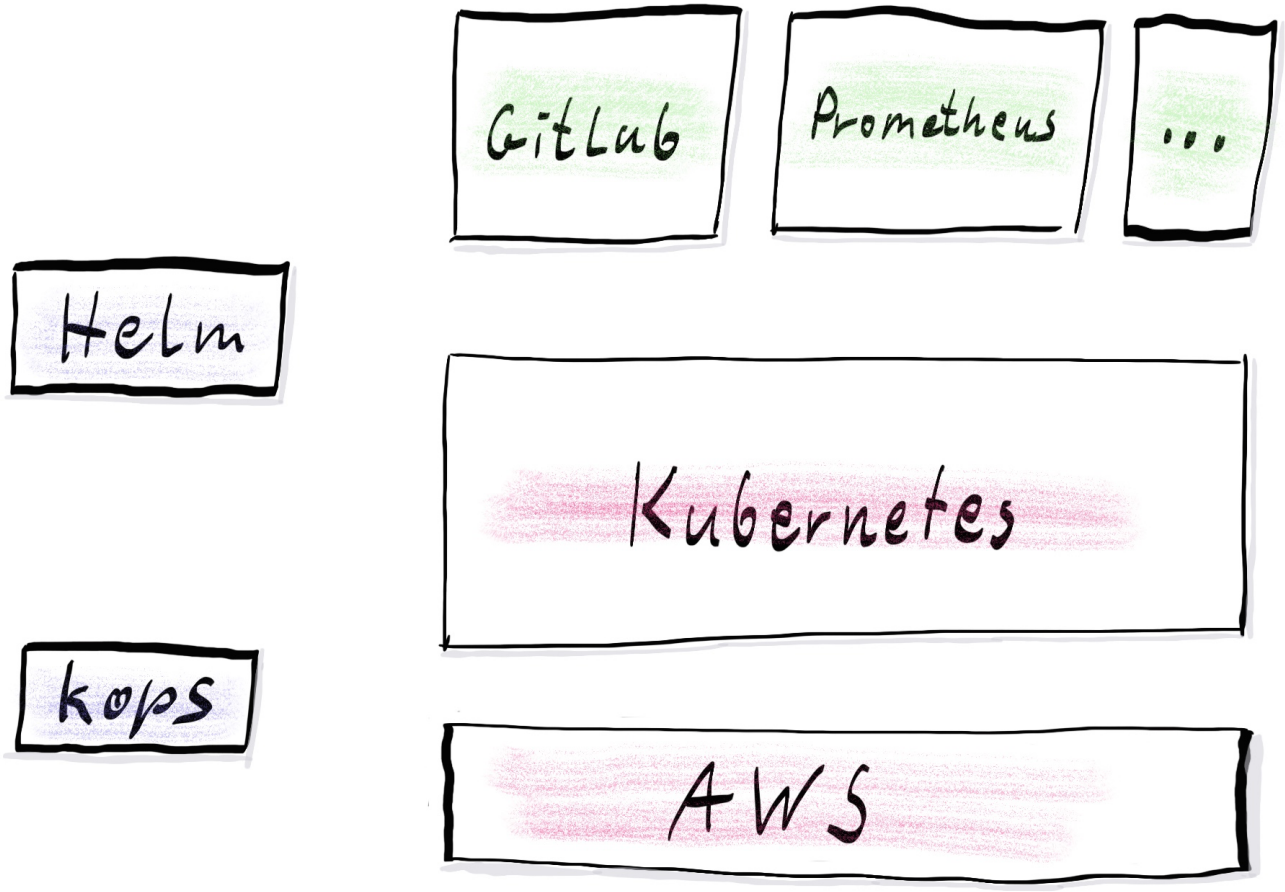
Quick Start

- start development soon
- stay closer to later production
- cover most steps
  from Git push to monitoring
- remain adaptable

Non Goals

- high availability
- multi-datacenter
- autoscaling
- complex security model

Main components



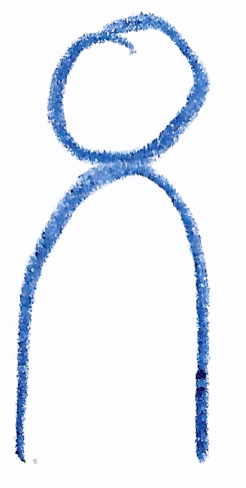
AWS

AWS

On my account
under my control.

What I need
when I need it.

customer



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Kubernetes

Kubernetes

- decides which Docker container to run on which node
- container health check
- restart container after container or node failure

Kubernetes

- in-cluster service discovery
- in-cluster load balancing
- make load balancer available on external network

Kubernetes

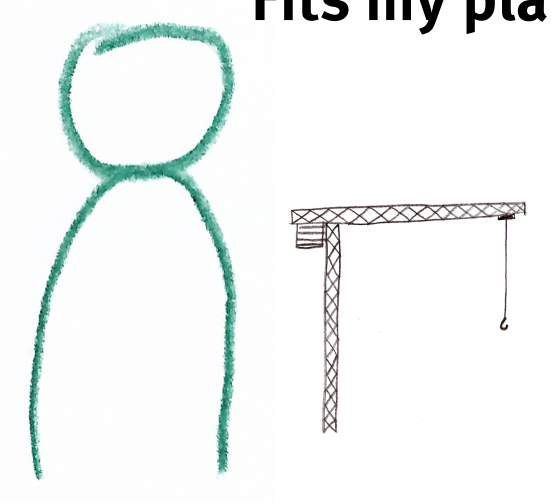
- secret management
- manage persistent storage (EBS)
- group several containers into “POD”, can access same persistent storage

Kubernetes

- runs on AWS
- runs on other clouds
- runs on bare metal

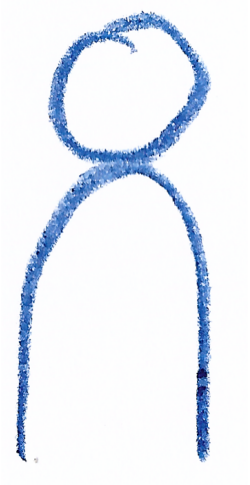
Kubernetes

Fits my plans.



customer

Our devs know + like it.



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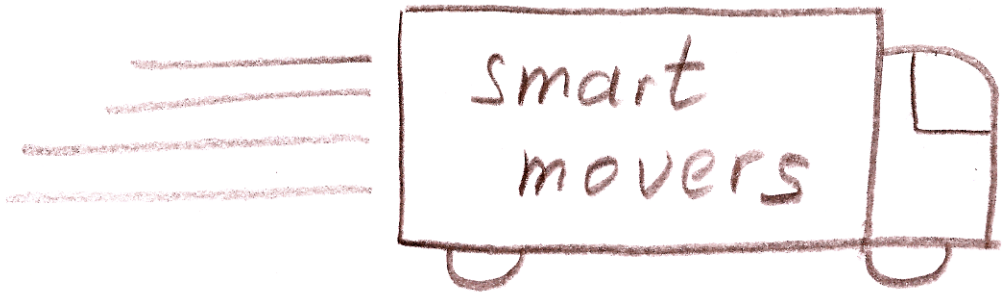

Prevents lock-in.

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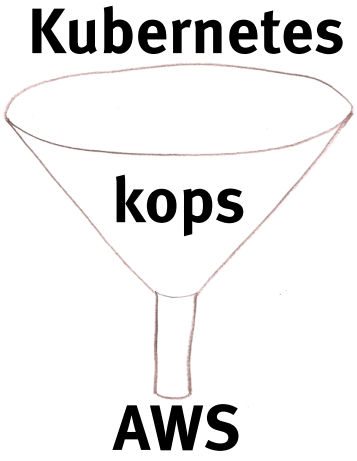
kops

kops



kops

- install Kubernetes on AWS
- makes (some) AWS services available to Kubernetes cluster
- helps to scale the cluster

kops

Installing a Kubernetes cluster on AWS
takes about 7 minutes

kops

Installing a Kubernetes cluster on AWS takes about 7 minutes

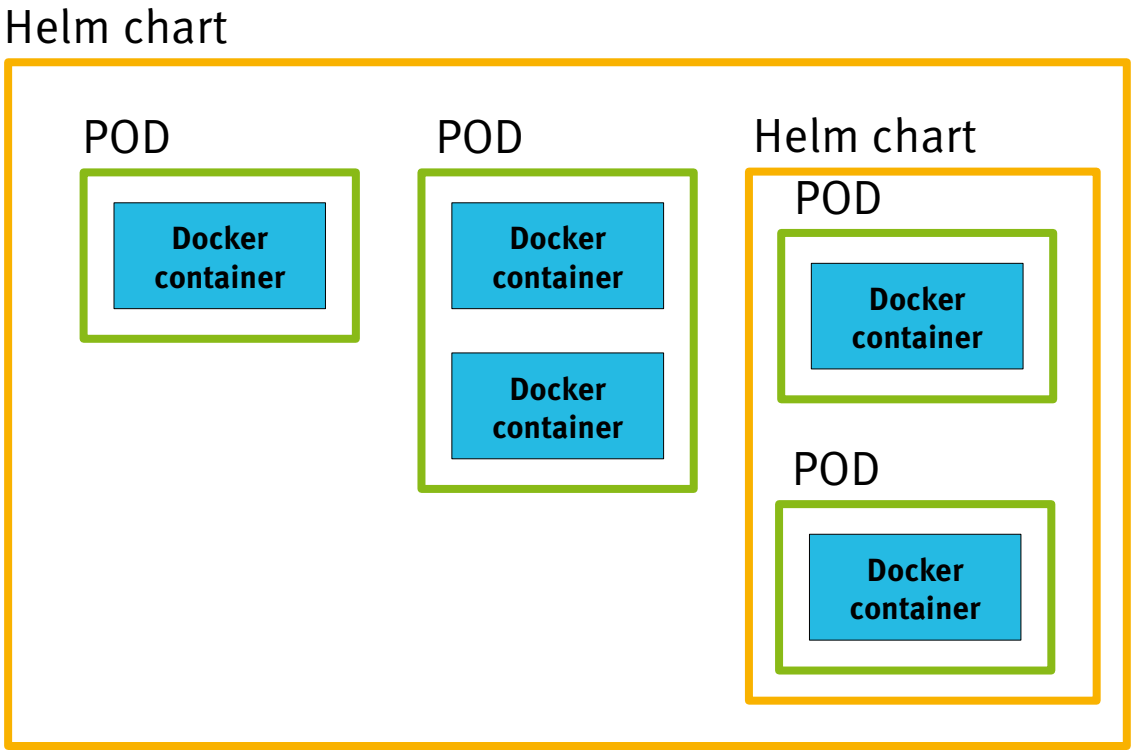
after AWS account and route 53 DNS subdomain are both set up,
and if the AWS availability zone can provide the nodes you need.

Helm

Helm

Kubernetes package- and dependency management

Helm


Helm chart
POD
Docker container
POD
Docker container
Docker container
Helm chart
POD
Docker container
POD
Docker container

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Helm

- adds depth and recursion to Kubernetes
- provides templating as basis for configuration
- configuration possible at any level,
  top-level overriding deep configuration

Helm

- **text-based**
  (not smart about change semantics)

Helm

- lifecycle hooks

Helm

**Many Helm charts exist,
ready to be used!**

https://kubeapps.com/

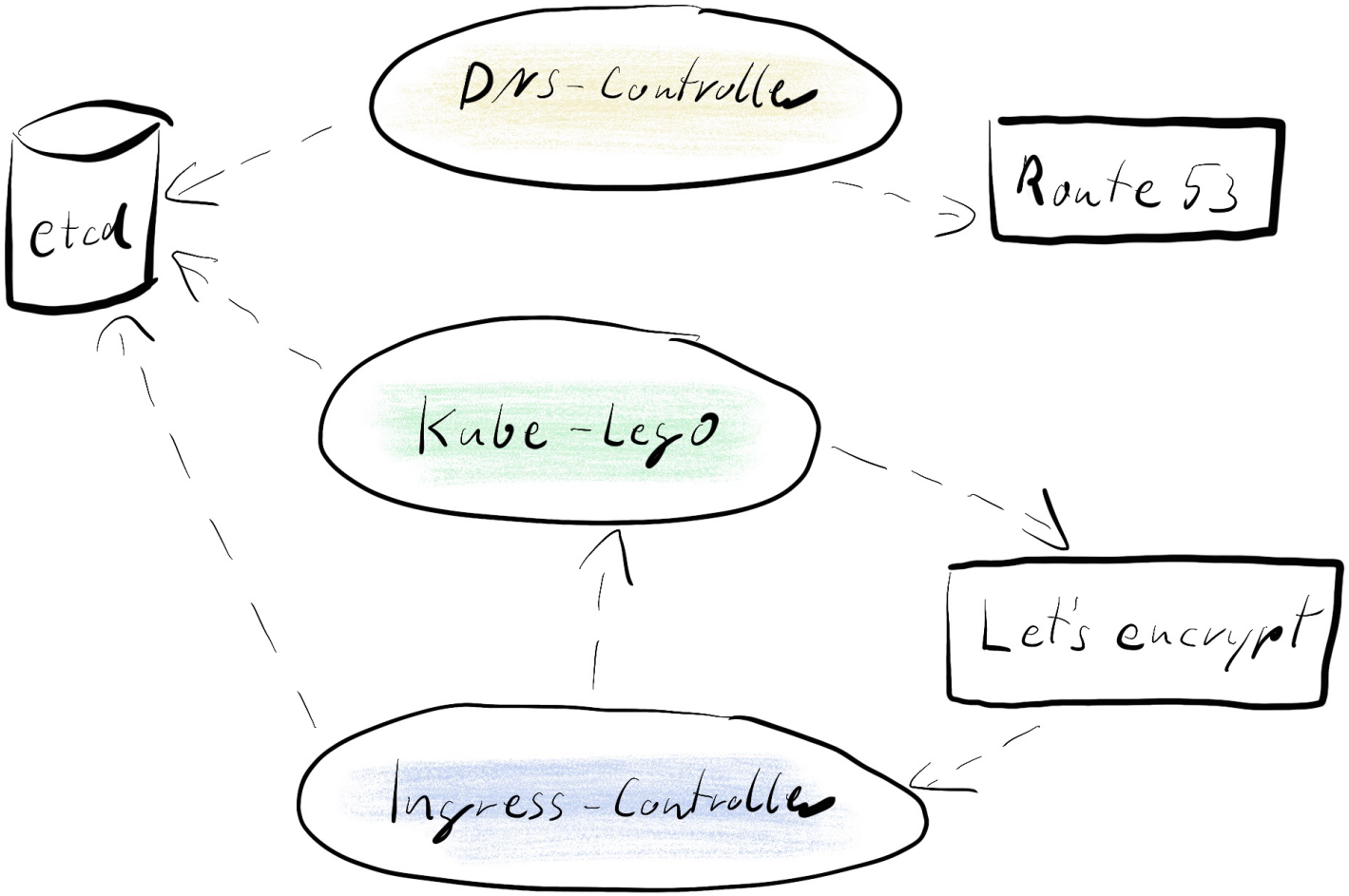
automatic https

Add some annotations

dns.alpha.kubernetes.io/external: subdomain.example.com

kubernetes.io/tls-acme: 'true'

Lots of background-action



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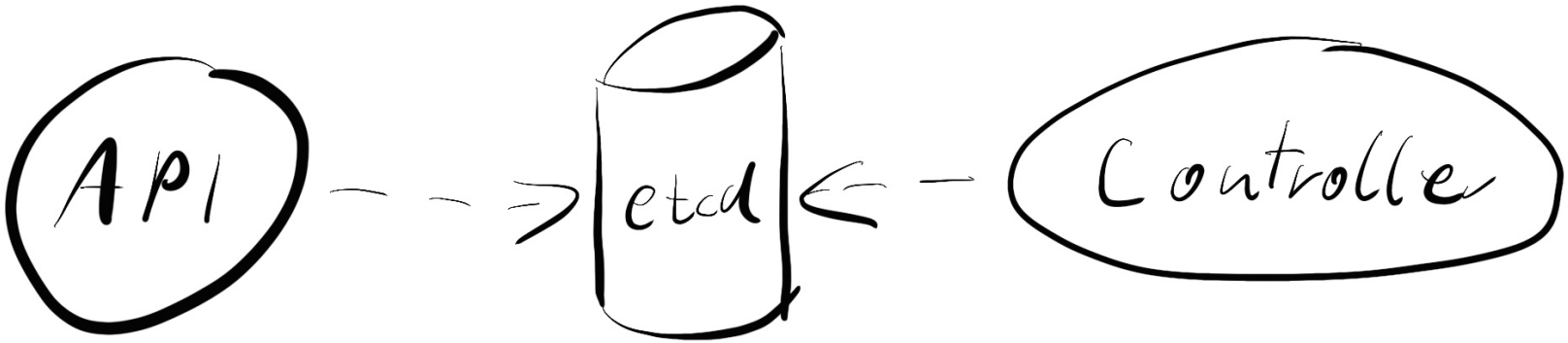
Controller in general



Gitlab

Gitlab as SCM

- place to keep your git repos
- provides issue system
- wiki
- pull request process

Gitlab as CI/CD

- Gitlab CI
- private Docker registry
- support for deploying into cluster

Gitlab on Kubernetes

- Helm Charts for Core and CI Runners
- charts include all dependencies (Dbs ...)
- Backup to S3

notable stuff
of our own

notable stuff of our own

- Setup Docker container
- Helm charts

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“setup” Docker container

“setup” Docker container

- All the CLIs installed ready to use (Kops, Kubernetes, Helm, AWS).
- A few scripts to automate things.

“setup” Docker container

- Can be used by developer on dev PC.
- Can be used by Gitlab-CI build.

“setup” Docker container

A Python script for our developers' PCs
saves them from having to remember + type
complicated docker command lines
(and saves us from having to document them in detail).

Helm charts

Helm charts

- for infrastructure
  such as monitoring, logging, Gitlab
- sample Helm chart
  to copy and use for a new microservice
  (there is also sample Gitlab-CI code)

Our overall experience

Our overall experience

Having fun building with big bricks.

Thank you!

Questions?

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