Continuous delivery while migrating to Kubernetes

Audun Fauchald Strand

@audunstrand

Øyvind Ingebrigtsen Øvergaard

@oyvindio

Agenda

FINN Infrastructure History

Kubernetes at FINN

Finn Infrastructure As A Service

Migration of Applications

Conclusions and Questions

What is FINN

Marketplace

Cars, real estate,
bits-and-pieces, travel, jobs

Norway’s second largest
website

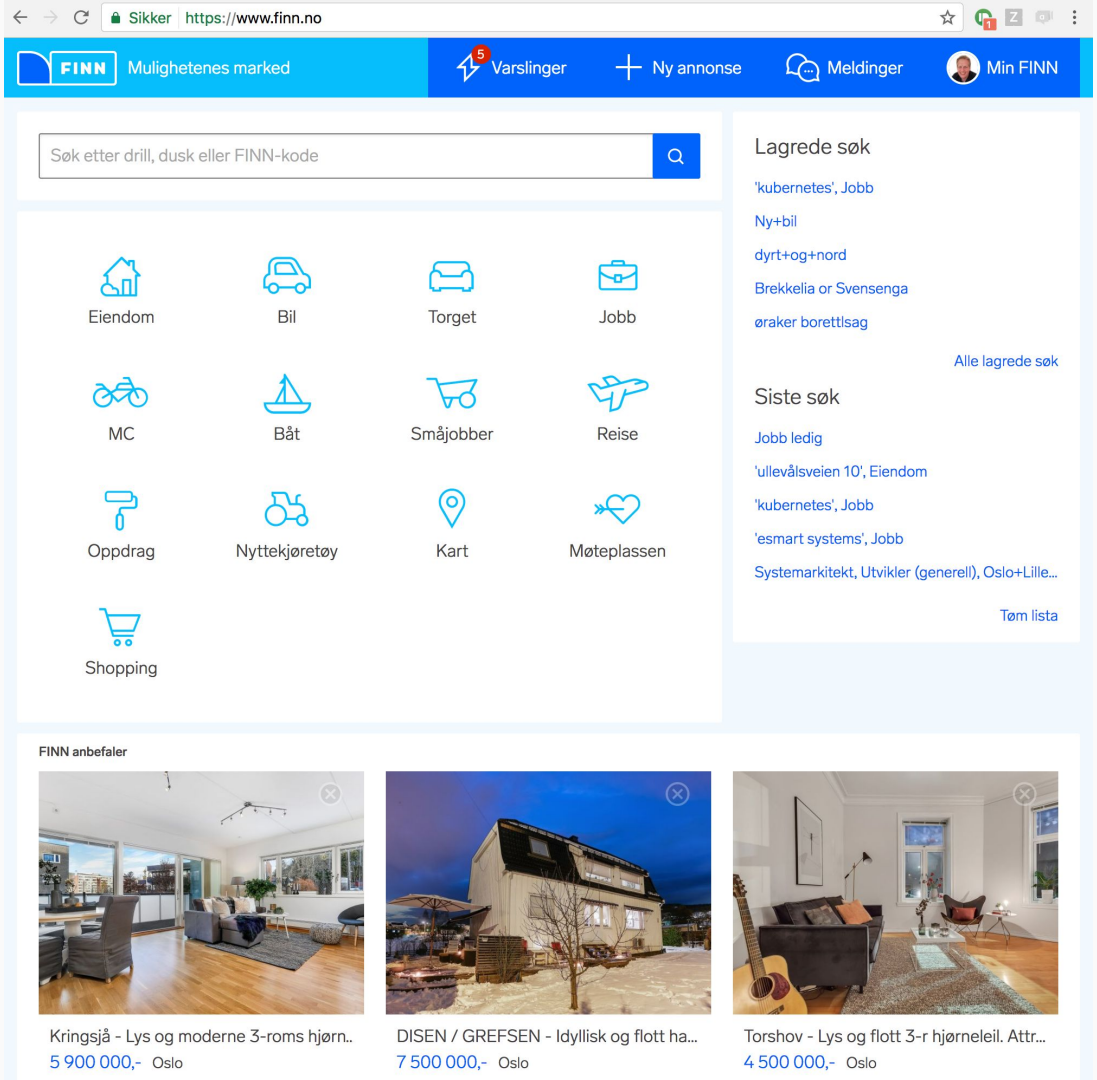
Part of Schibsted

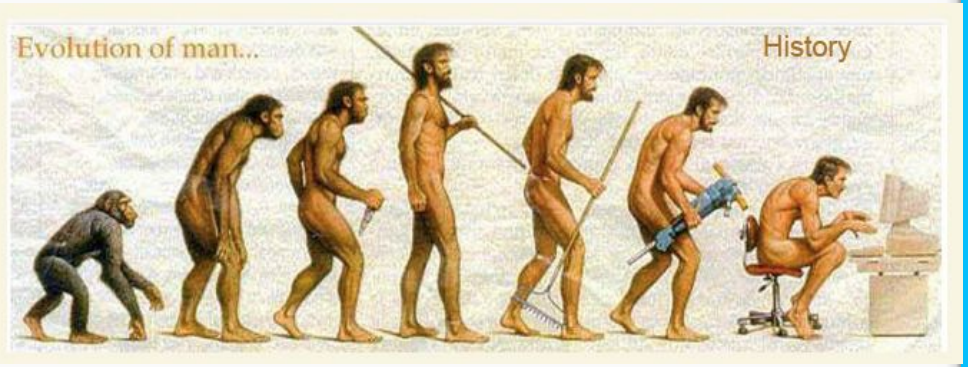
120 developers

350 microservices

1200 deployments pr week

6 minutes (median) from push to deploy





FINN Infrastructure History

Kubernetes at FINN

Finn Infrastructure As A Service

Migration of Applications

Conclusions and Questions

Services
3 → 350

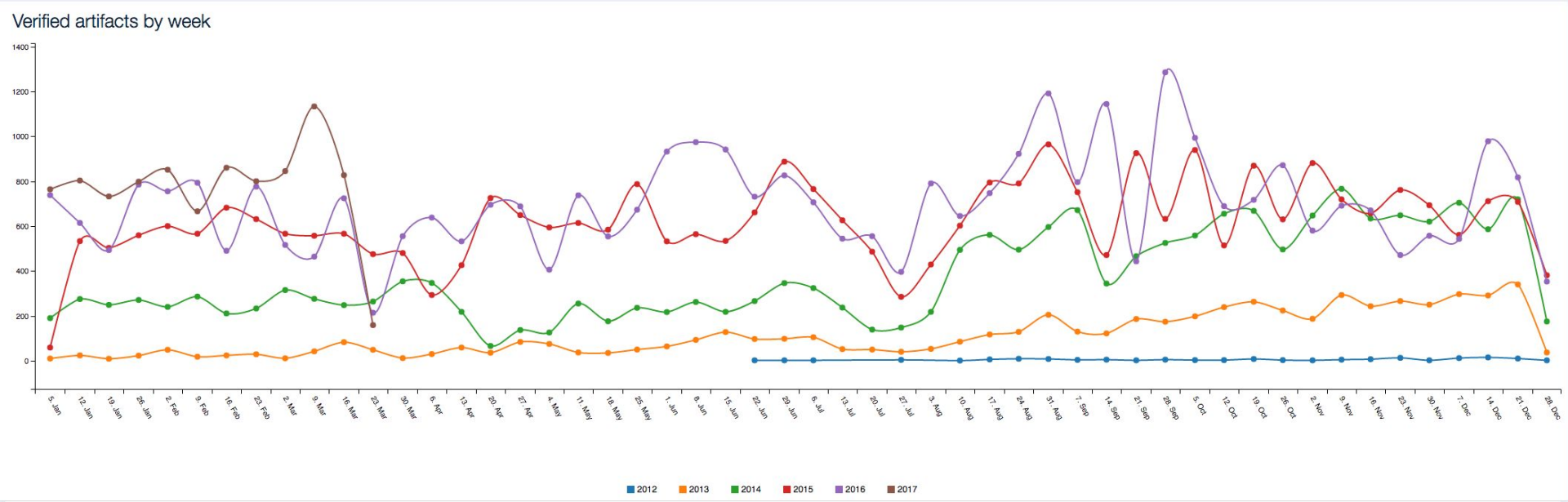
Virtual Machines
10s → 100s

Developers
40 → 130

Deployments
1/week → 1000/week

We have outgrown our infrastructure and deployment system

Continuous Delivery at FINN.no over time



Containers

Scheduling: Where should my container run?

Lifecycle and health: Keep the container running despite failures

Discovery: Where is my container now?

Monitoring: What is happening with my container?

Auth{n,z}: Who can do what with my container?

Aggregates: Compose containers into jobs

Scaling: Manage variable load

FINN Infrastructure History

Kubernetes at FINN

Finn Infrastructure As A Service

Migration of Applications

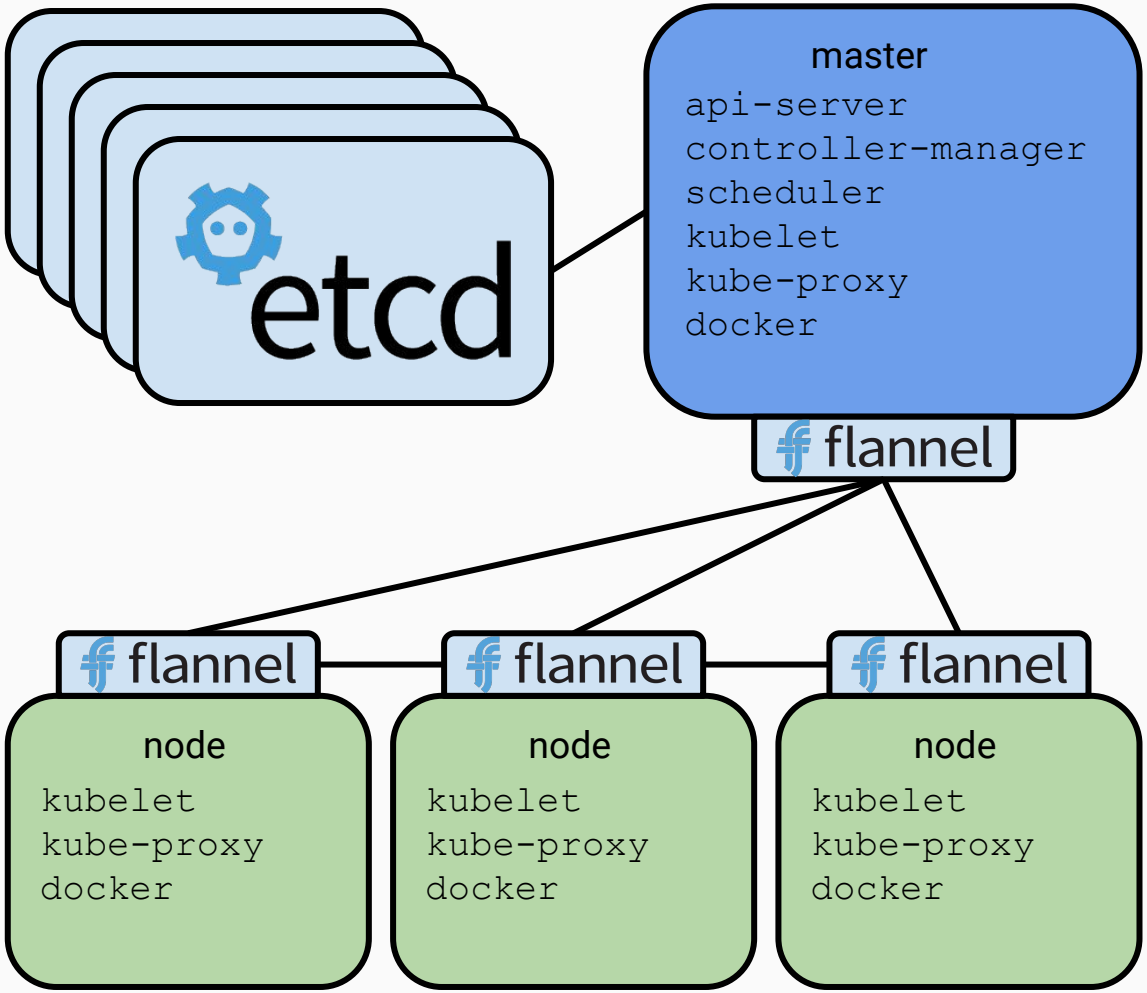
Conclusions and Questions

On premise

The hard way before it was cool

“Private cloud” to bare metal

Google container engine



Google Container Engine

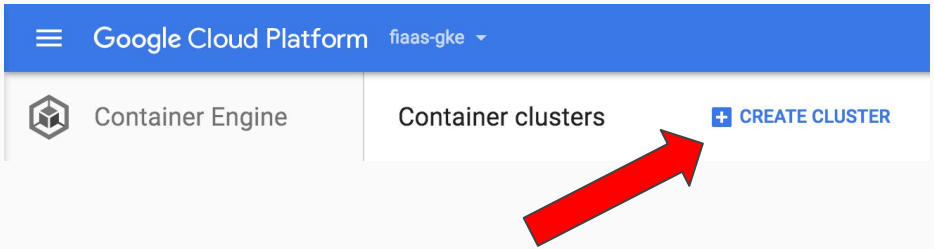
Extremely easy cluster provisioning

Less ops overhead

Might be harder to integrate with existing infrastructure

Latency

(Legal)



FINN Infrastructure History

Kubernetes at FINN

Finn Infrastructure As A Service

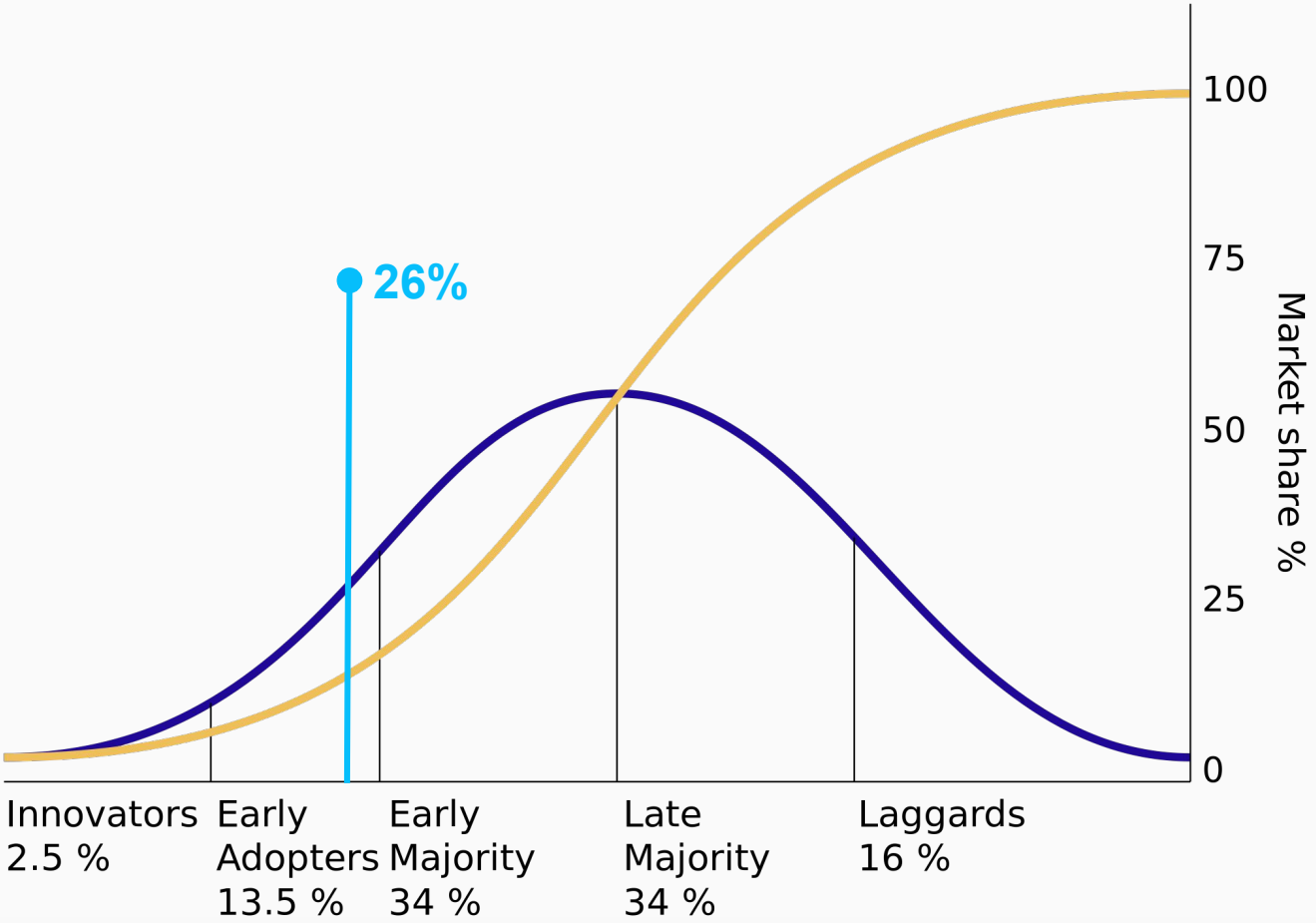
Migration of Applications

Conclusions and Questions

FIAAS

Finn Infrastructure As A Service

FIAAS - Solving FINN.no’s problems



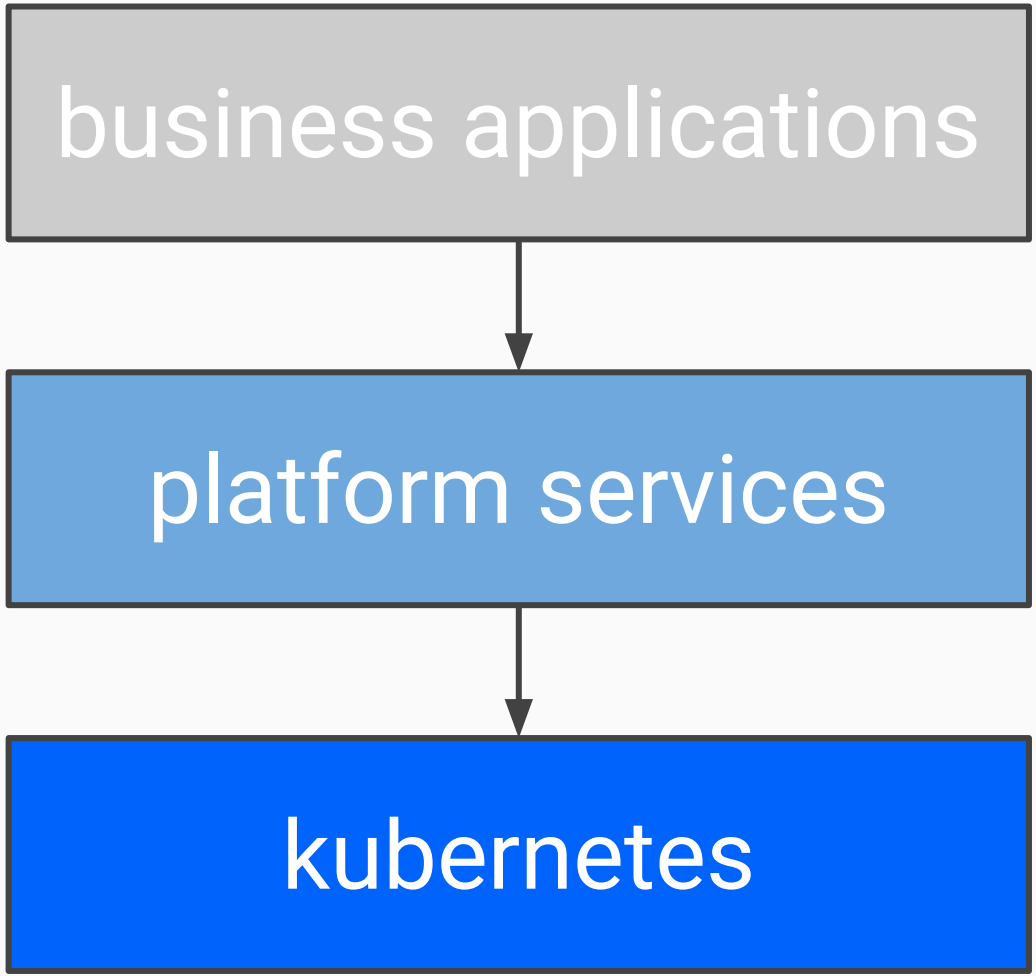
Current adoption rate of FIAAS at FINN

Layering

Kubernetes
- On-premise
- Google Container Engine

Platform Services
- Helm pipeline

Business Applications
- FIAAS pipeline



Contracts

app-config

deployment

metrics

logs

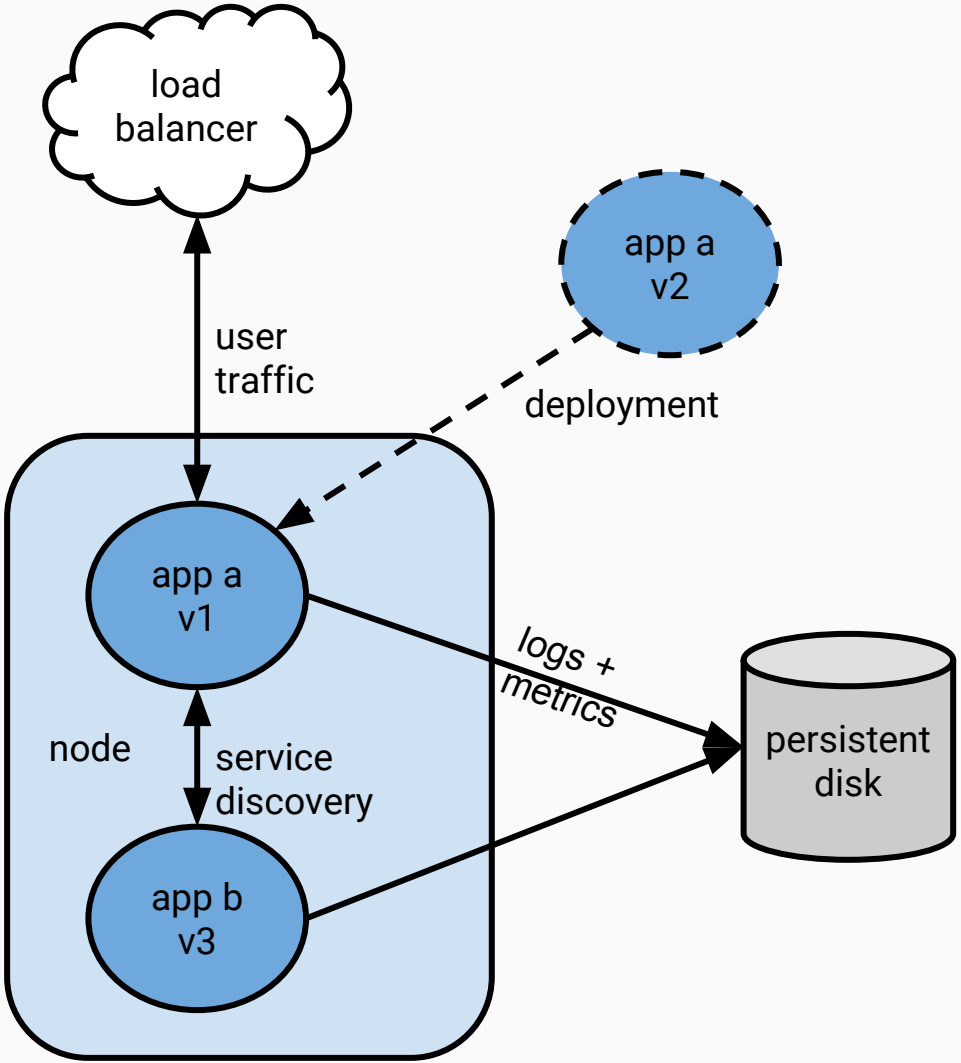
load balancing

service discovery

scaling

secrets

healthchecks



Kubernetes manifests vs. fiaas.yaml

147 loc

```
---
apiVersion: extensions/v1beta1
kind: Deployment
metadata:
  annotations:
    deployment.kubernetes.io/revision: "81"
  generation: 168
  labels:
    app: finnlet-server
    fiaas/deployed_by: "20161013140423"
    fiaas/version:
o5m3dbca9u0m1ds2mlqgprsv3v
  name: finnlet-server
  namespace: default
spec:
  replicas: 10
  selector:
    matchLabels:
      app: finnlet-server
  strategy:
    rollingUpdate:
      maxSurge: 1
      maxUnavailable: 1
    type: RollingUpdate
  template:
    metadata:
      annotations:
        prometheus.io/path:
/internal-backstage/prometheus
        prometheus.io/port: http
        prometheus.io/scrape: "true"
      creationTimestamp: null
      labels:
        app: finnlet-server
        fiaas/deployed_by: "20161013140423"
        fiaas/version:
o5m3dbca9u0m1ds2mlqgprsv3v
      name: finnlet-server
      namespace: default
    spec:
      containers:
      - env:
```

9 loc

```
---
version: 2
replicas: 10
ports:
 - target_port: 8080
healthchecks:
 liveness:
   http:
     path: /internal-backstage/health/
```

The contract between applications and infra

More flexibility in changing underlying infra

Convention over configuration

Smart defaults in code - not templates

Deployment

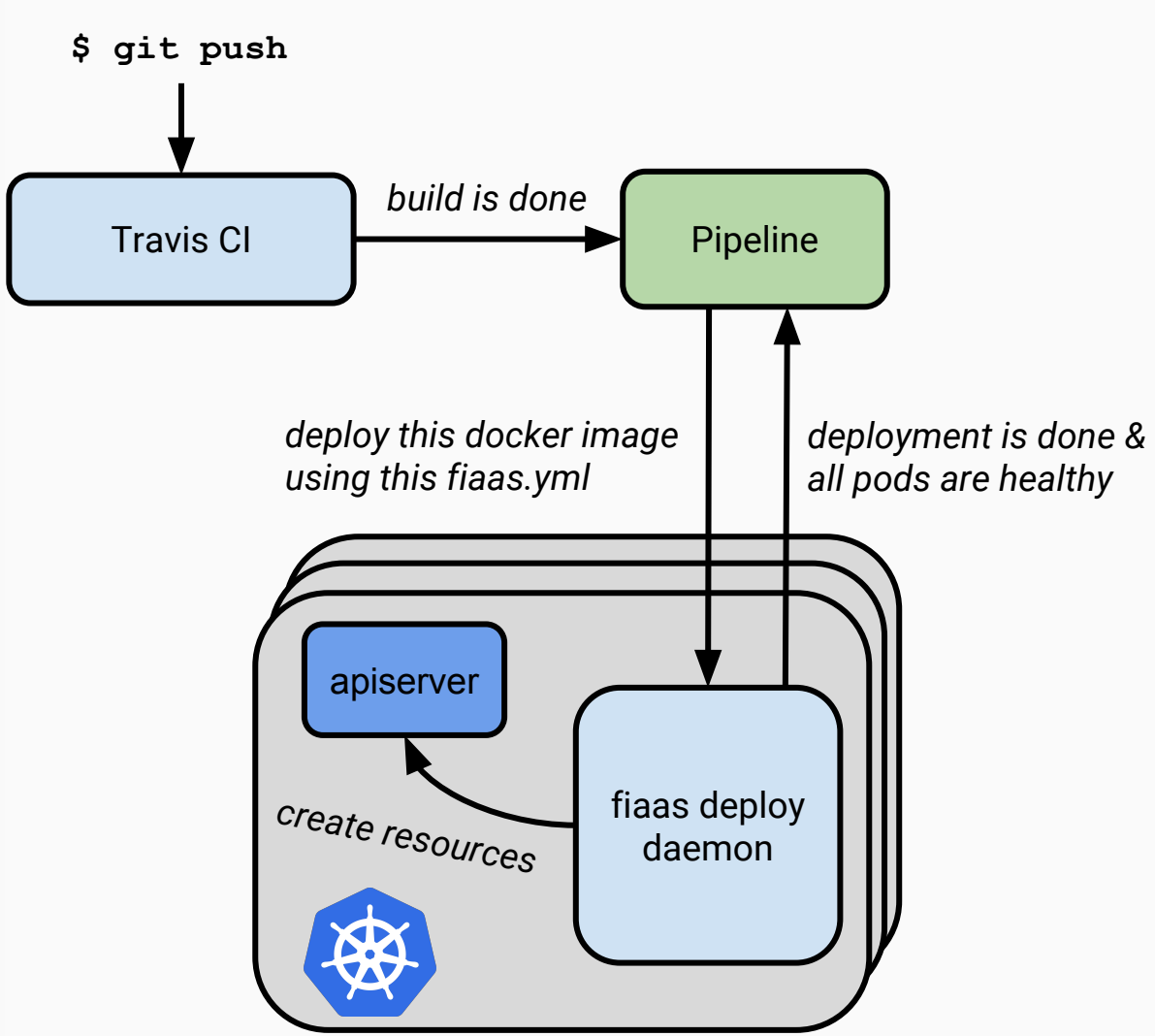
Deployable

- config file: `fiaas.yaml`
- image: `$team/$app:$version`

Fiaas deploy daemon - operator

Process

- Package deployable
- Pipeline post to kafka topic
- Deploy daemon subscribes to topic
- Deploy daemon creates k8s resources



Observability

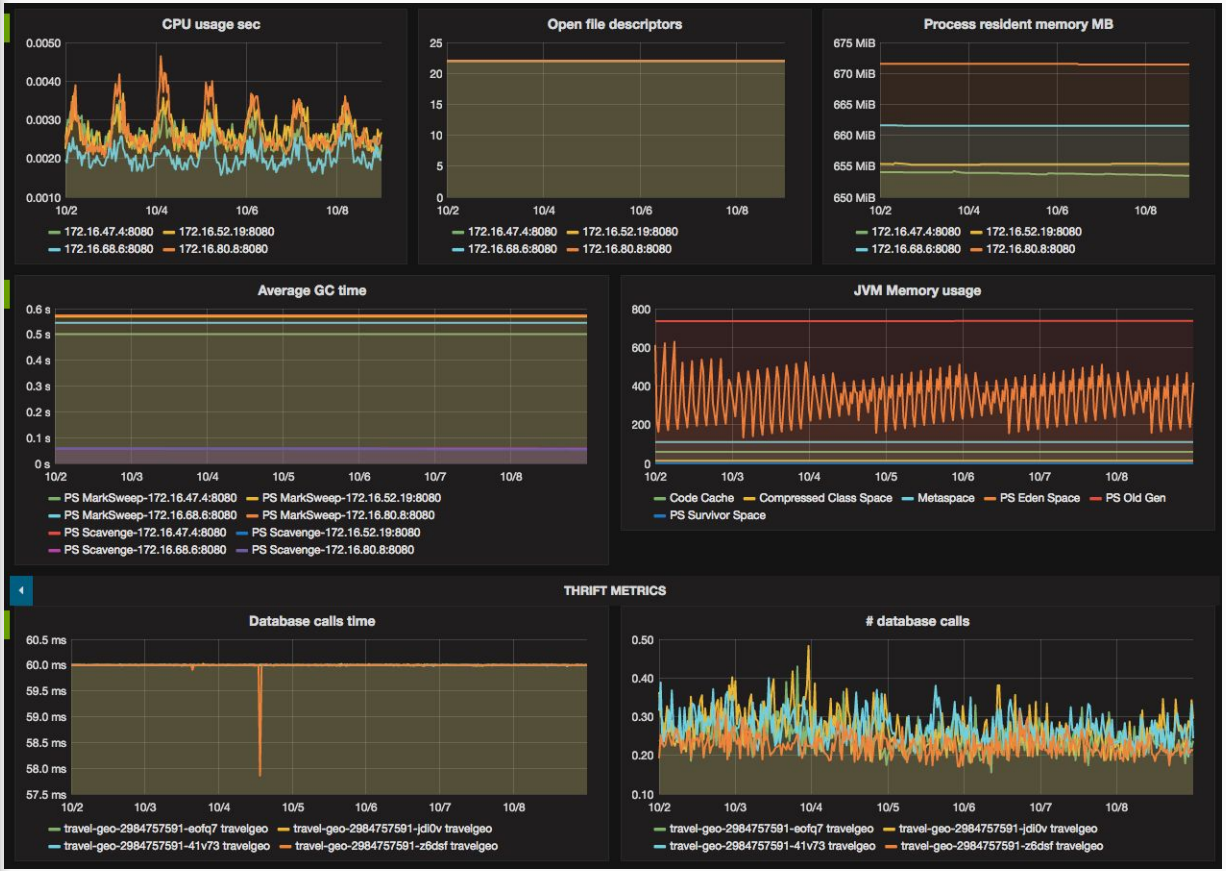
Logging

- Elasticsearch
- fluentd
- Kibana

Metrics

- Prometheus
- Grafana
- Generic app dashboard

fiaas-canary



FINN Infrastructure History

Kubernetes at FINN

Finn Infrastructure As A Service

Migration of Applications

Conclusions and Questions

Adapting apps

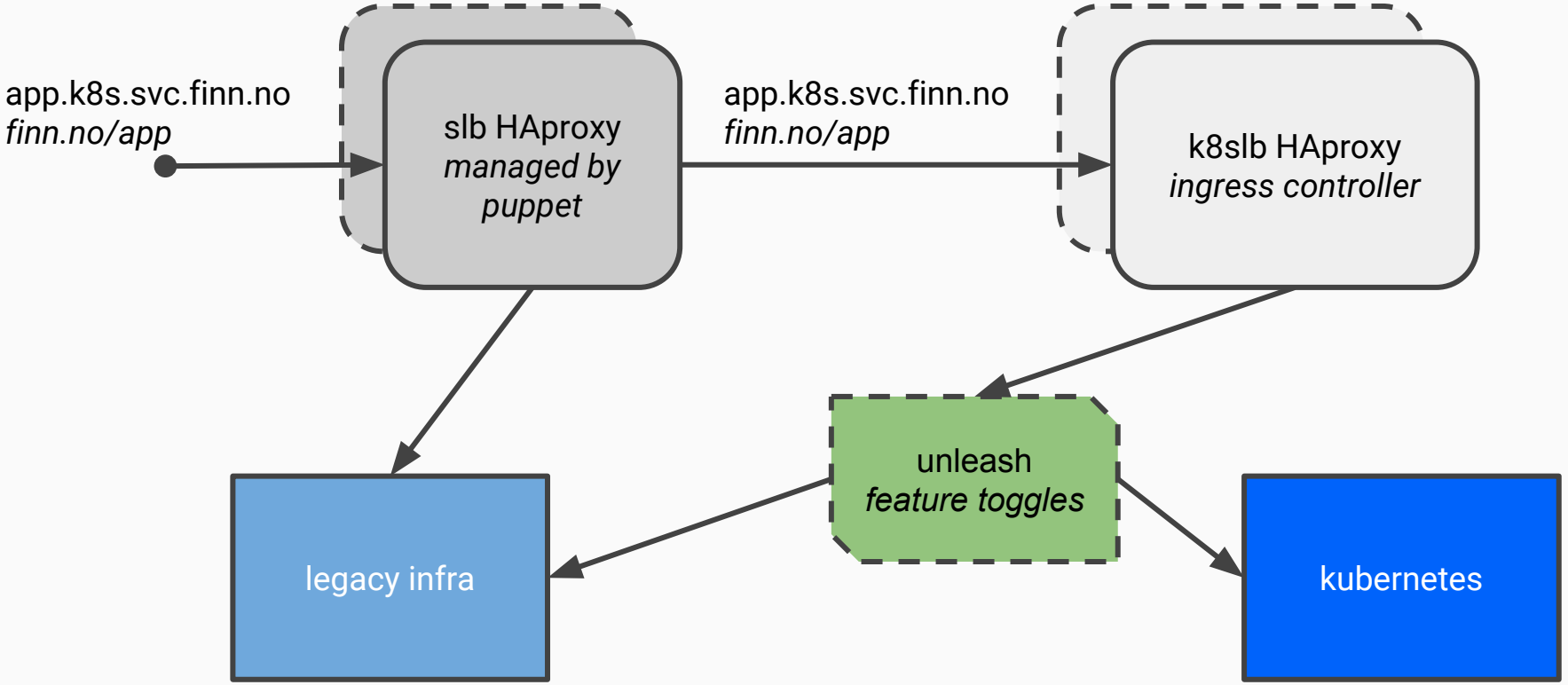
12 factor

health checks

resource constraints

secrets

ingress



User traffic ingress

Feature toggles

migrate percentages of user/client traffic

at the load balancer

at the client

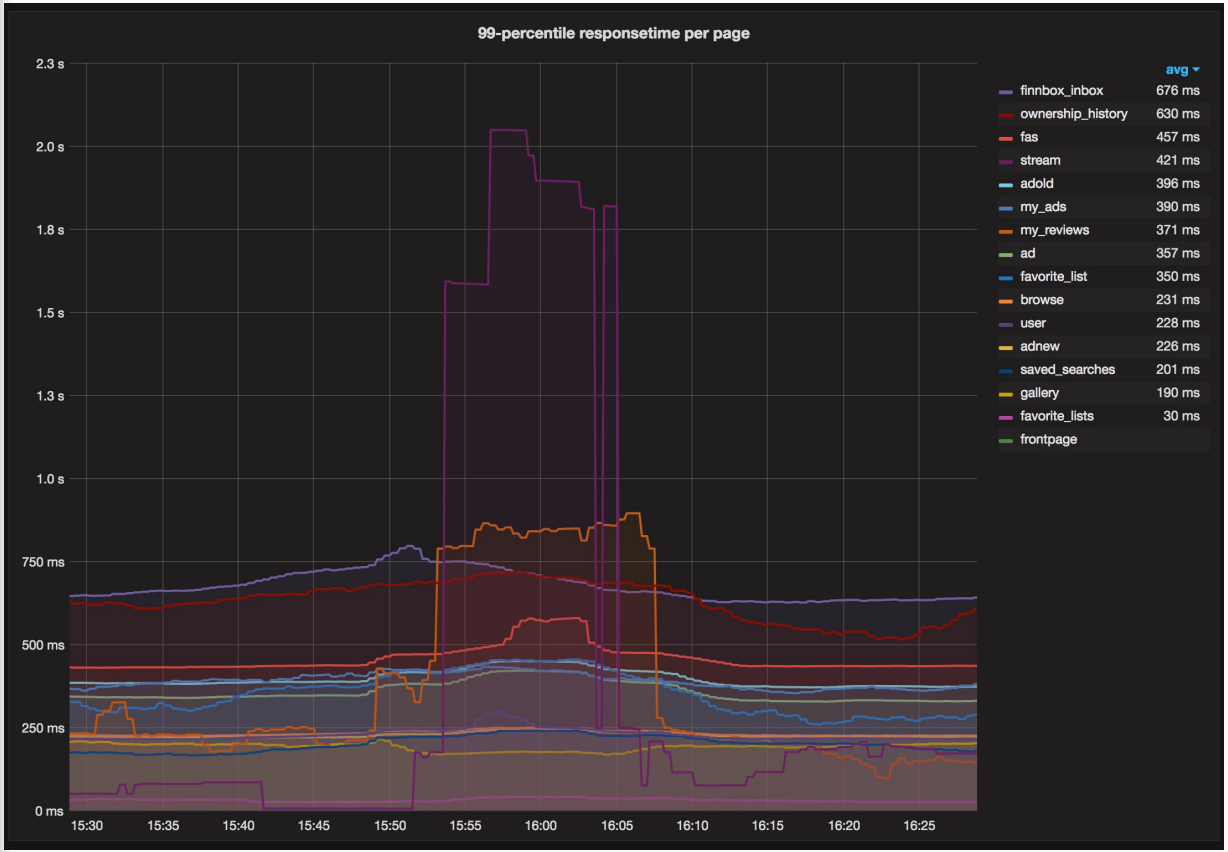
Useful metrics

response time per call

response status per call

resource usage

app specific metrics



Conclusions

Questions?

Øyvind Ingebrigtsen Øvergaard

@oyvindio

oyvind.overgaard@gmail.com

Audun Fauchald Strand

@audunstrand

audunstrand@gmail.com