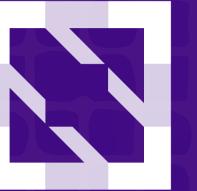




KubeCon



CloudNativeCon



OPEN SOURCE SUMMIT

China 2019





KubeCon



CloudNativeCon



OPEN SOURCE SUMMIT

China 2019

7 tips and tricks on how to make the most of your Kubernetes journey

Daniele Polencic



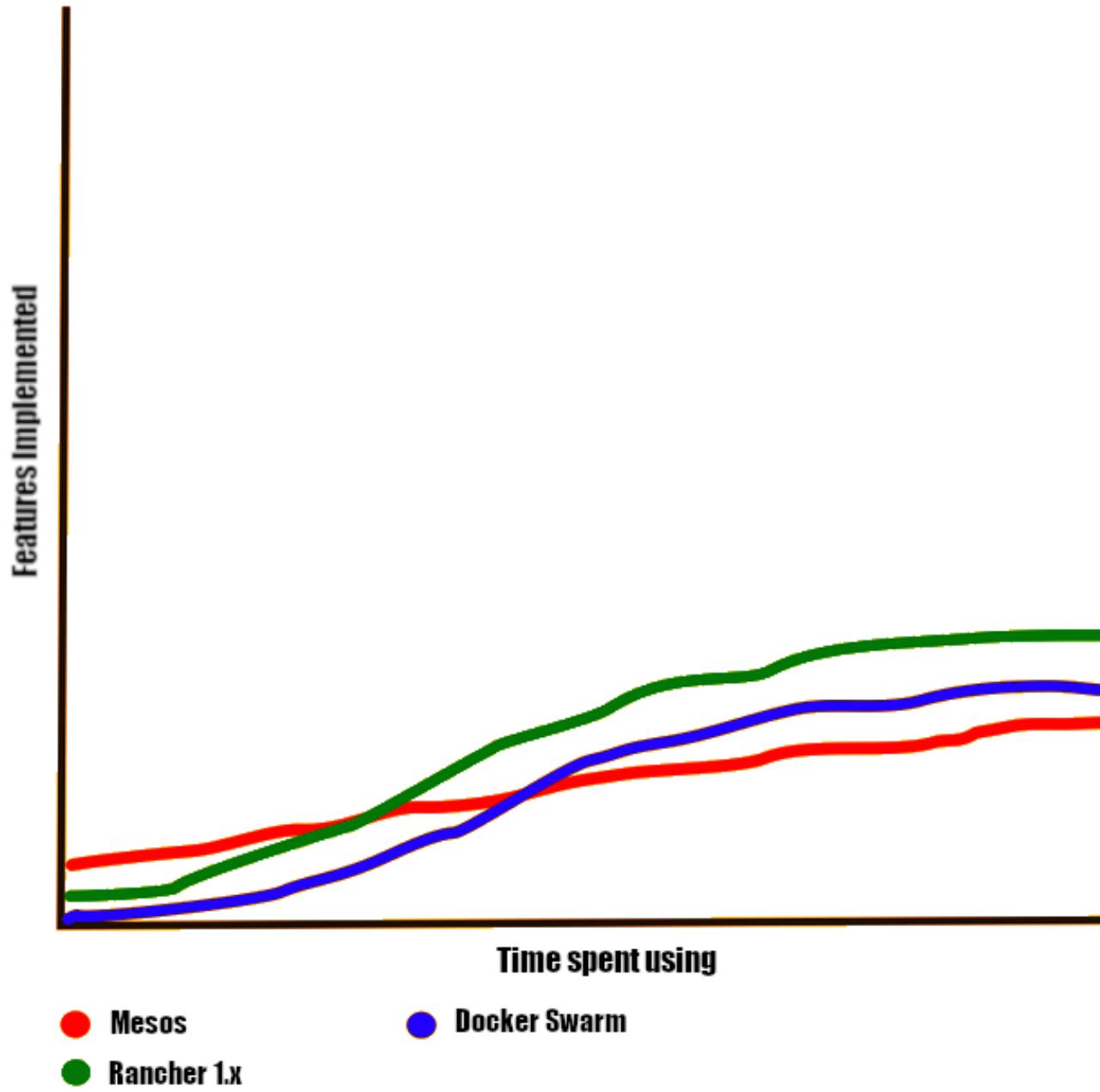
learnk8s



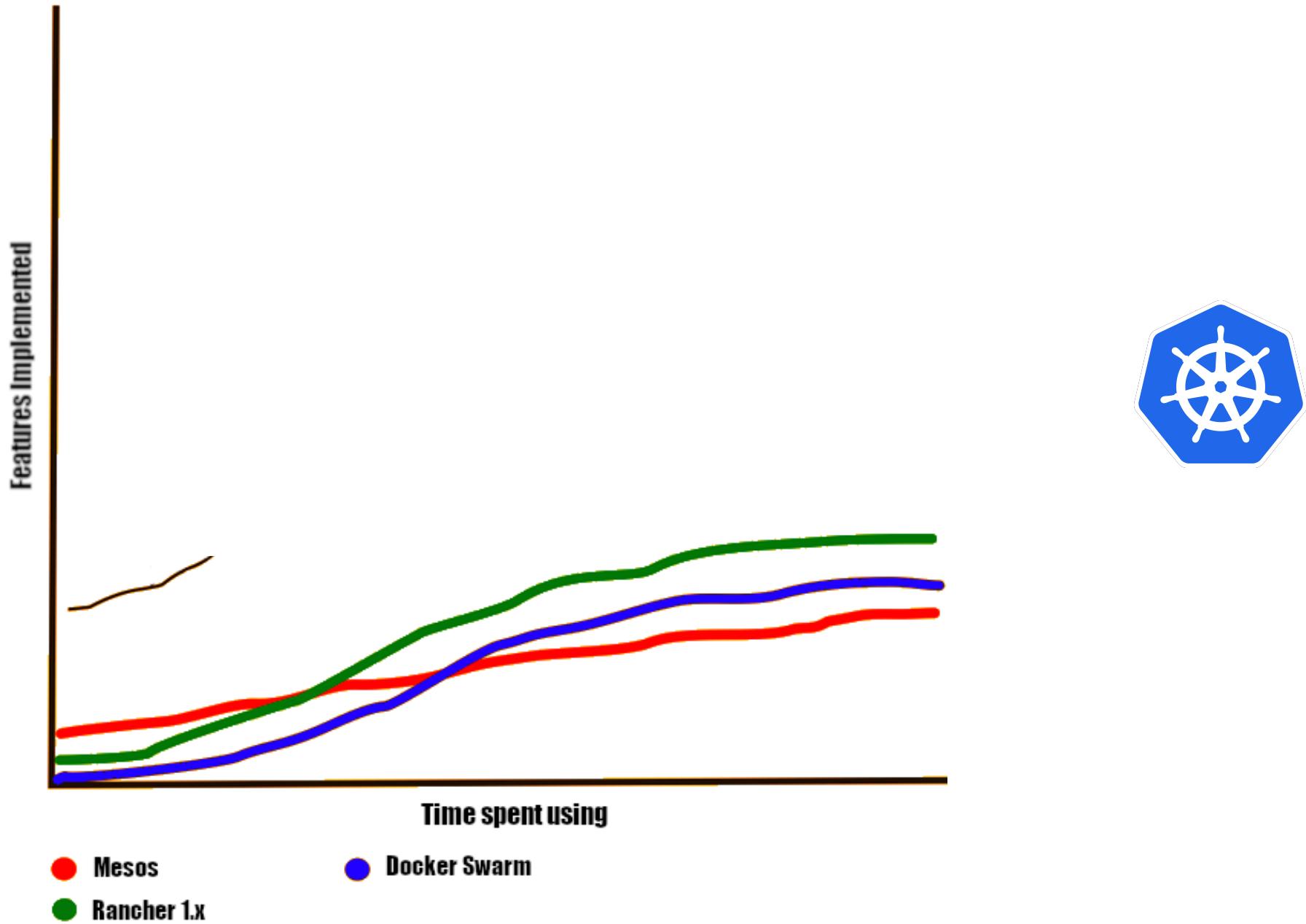


Take it easy

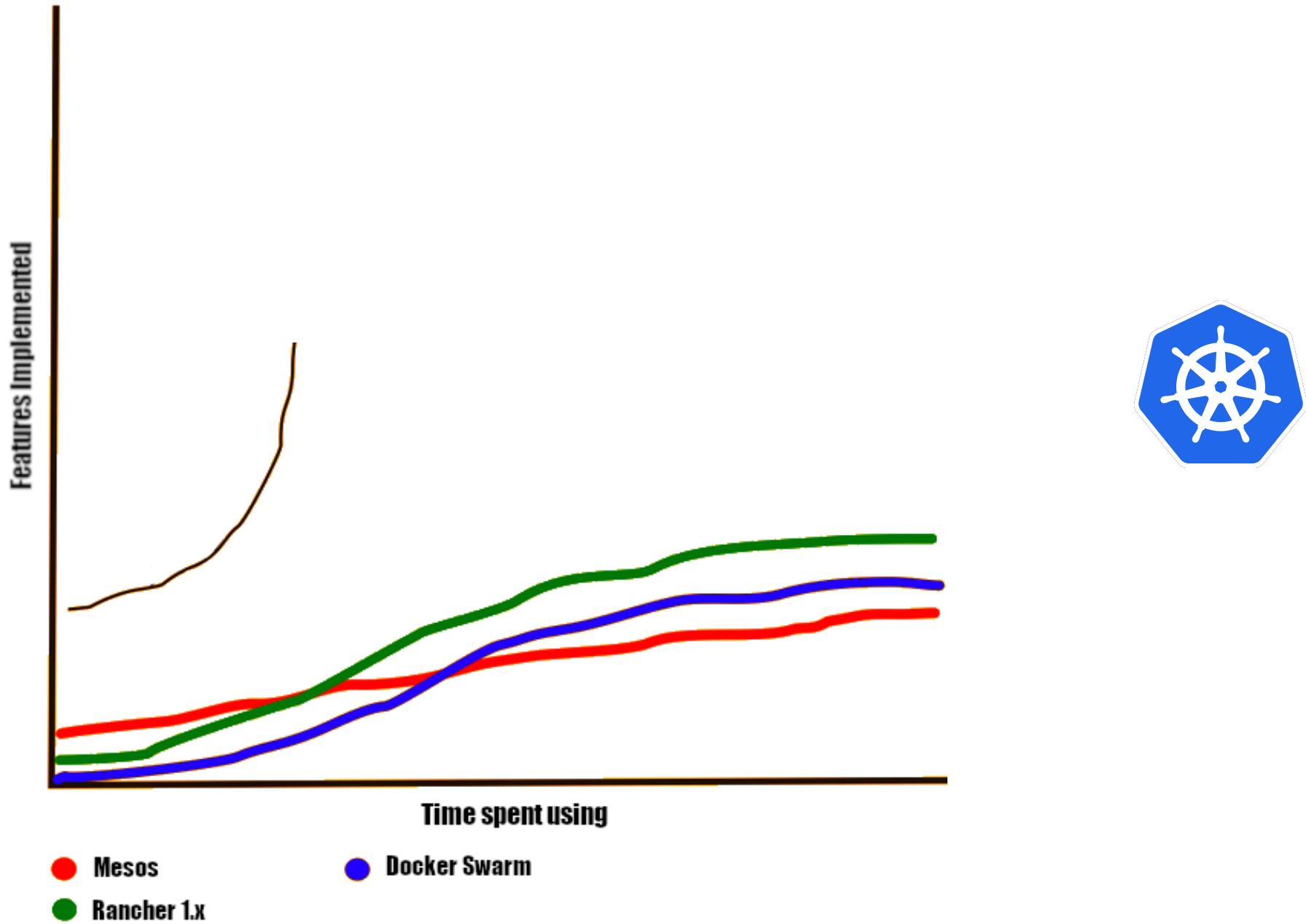
Learning curves of some Container Orchestration Engines



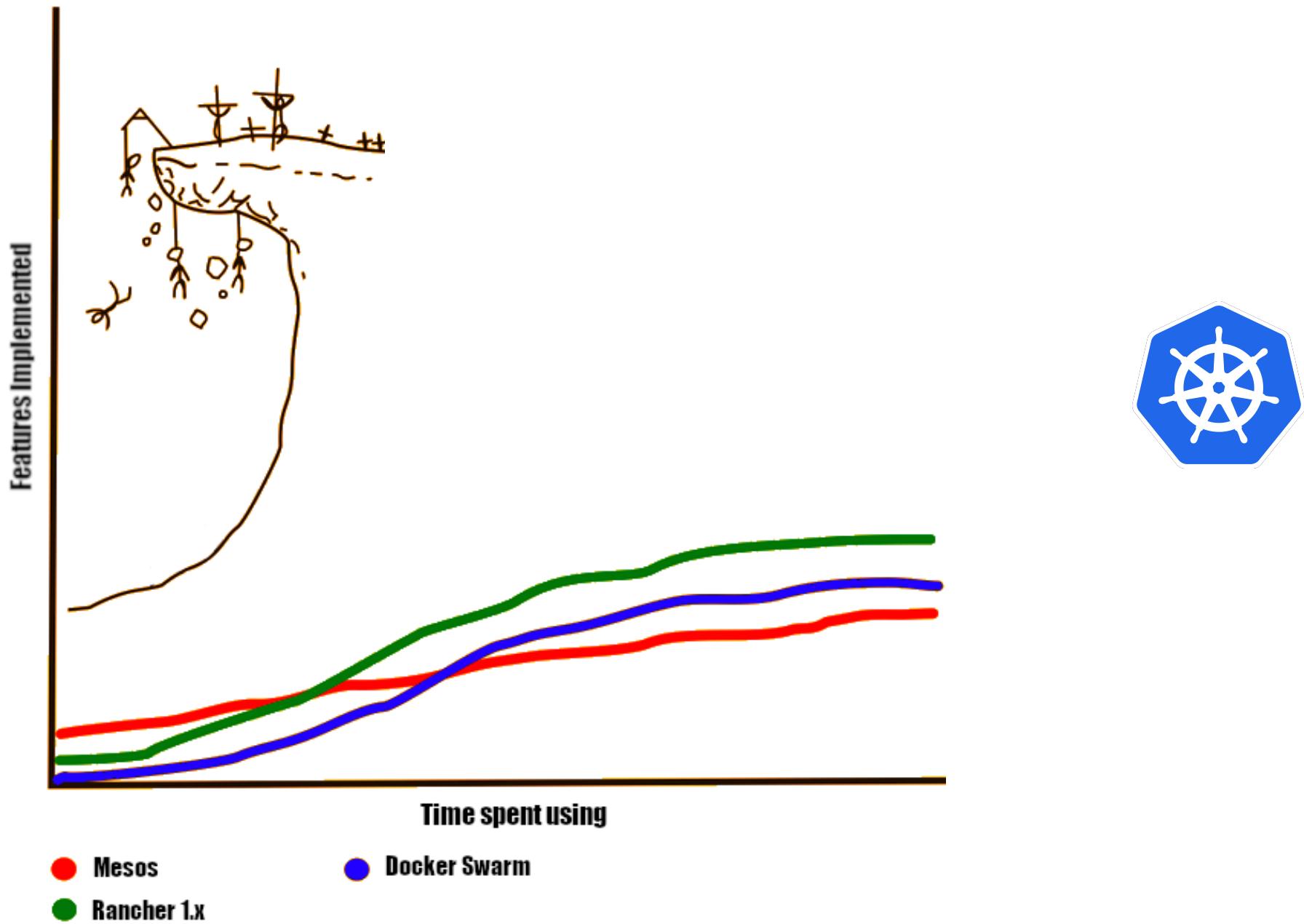
Learning curves of some Container Orchestration Engines



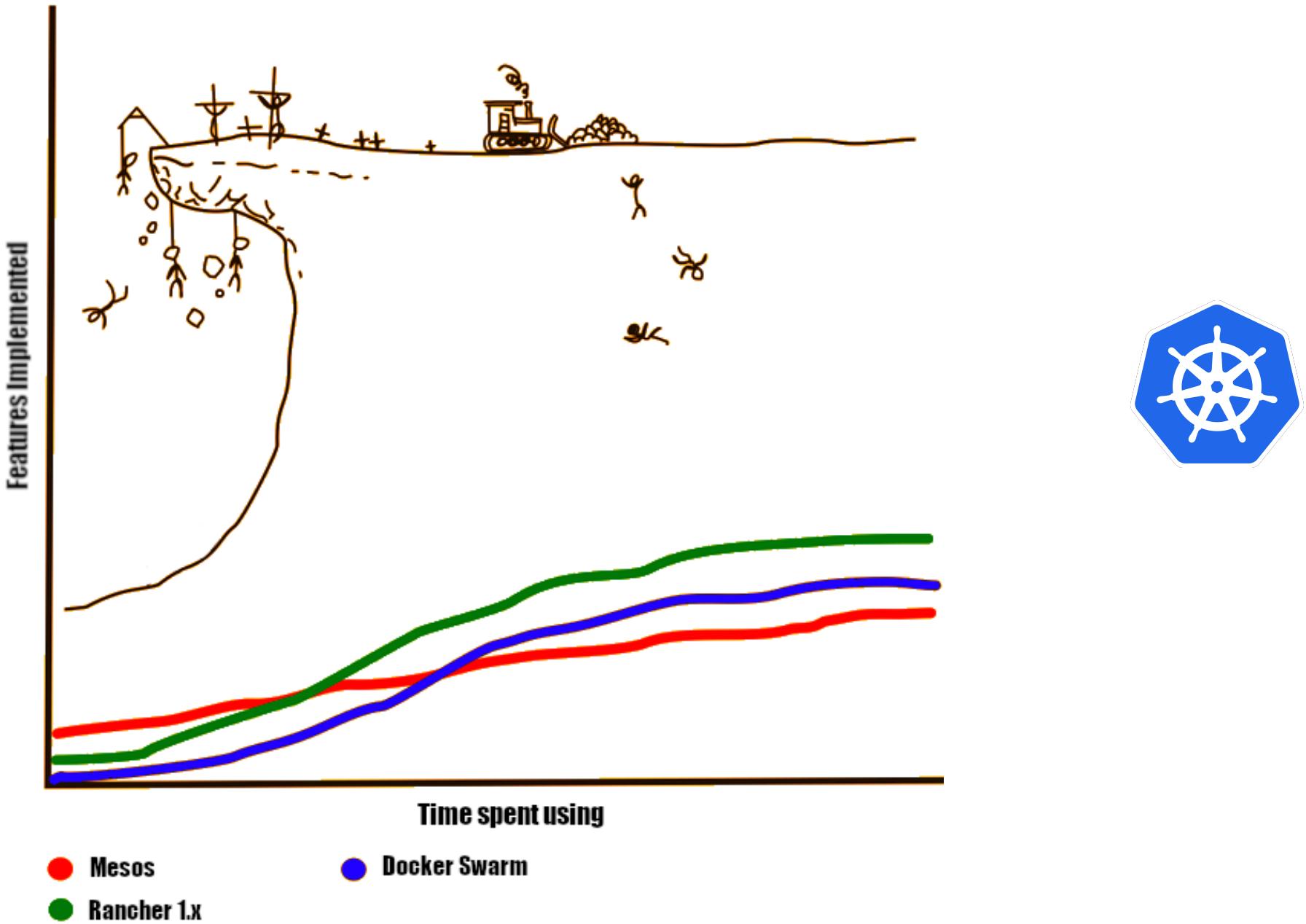
Learning curves of some Container Orchestration Engines



Learning curves of some Container Orchestration Engines



Learning curves of some Container Orchestration Engines





Boosting productivity



bash

```
$ kubectl get de
```



bash

```
$ kubectl get de
```

TAB-->

A large, bold, black text box containing the word "TAB" followed by a right-pointing arrow. The text is centered and has a white background with a thin black border.



bash

```
$ kubectl get deployment
```

kubectl completion

1. kubectl explain

1. kubectl explain

2. kubectx, kubens

1. kubectl explain

2. kubectx, kubens

3. krew

1. kubectl explain

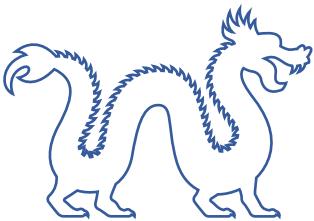
2. kubectx, kubens

3. krew

4. kube-ps1

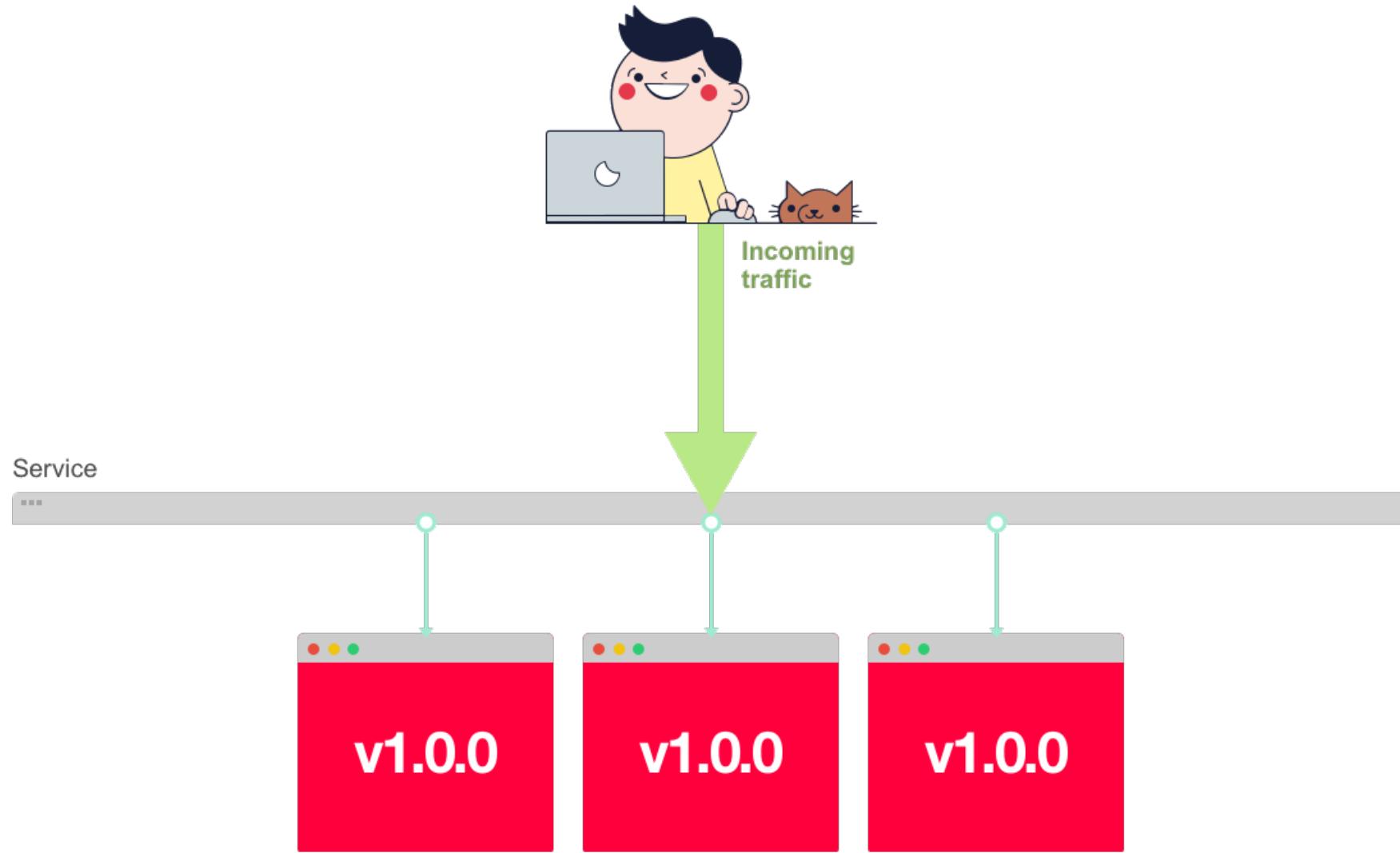
<https://learnk8s.io/blog/kubectl-productivity>

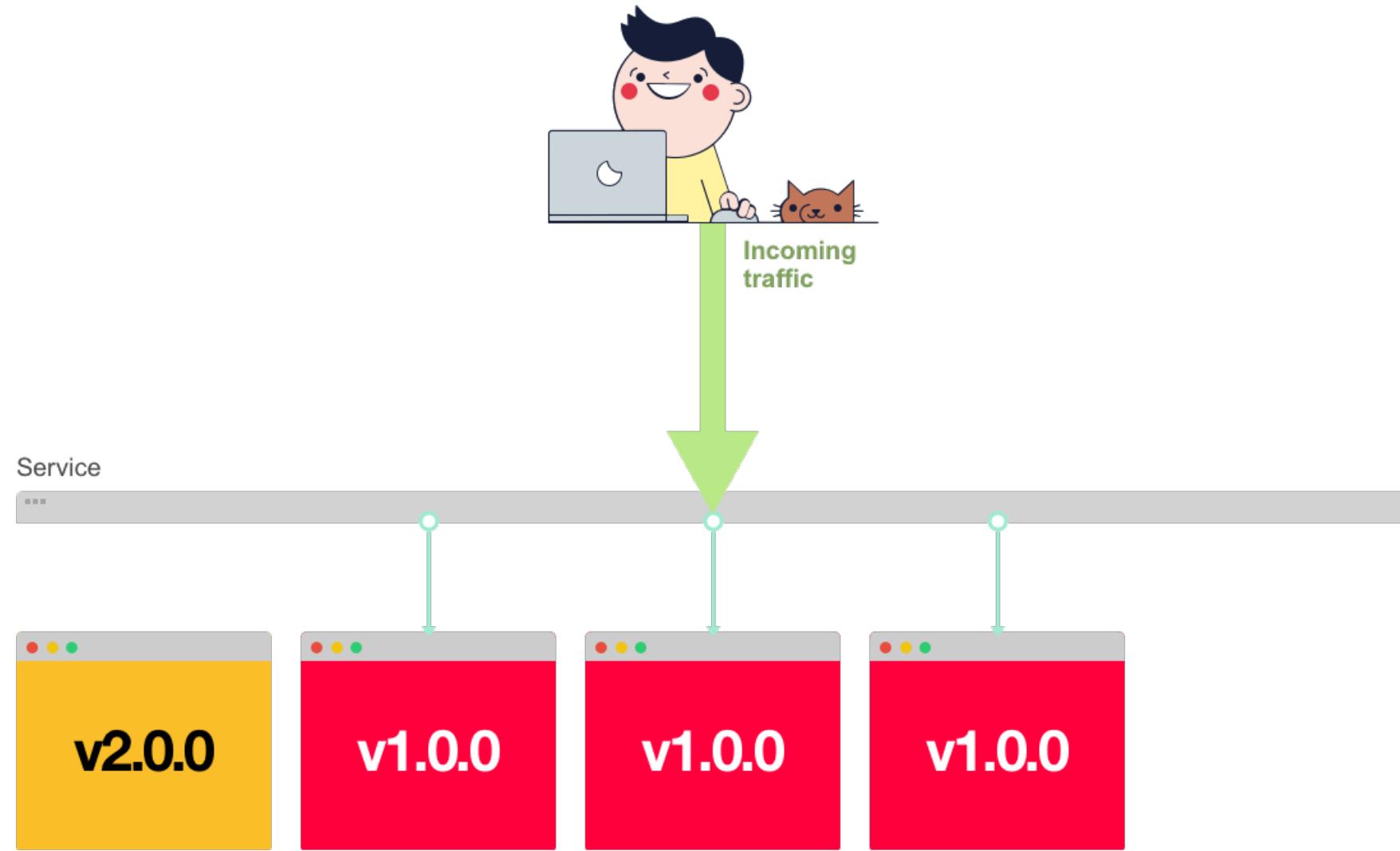
<https://itnext.io/pimp-my-kubernetes-shell-f144710232a0>

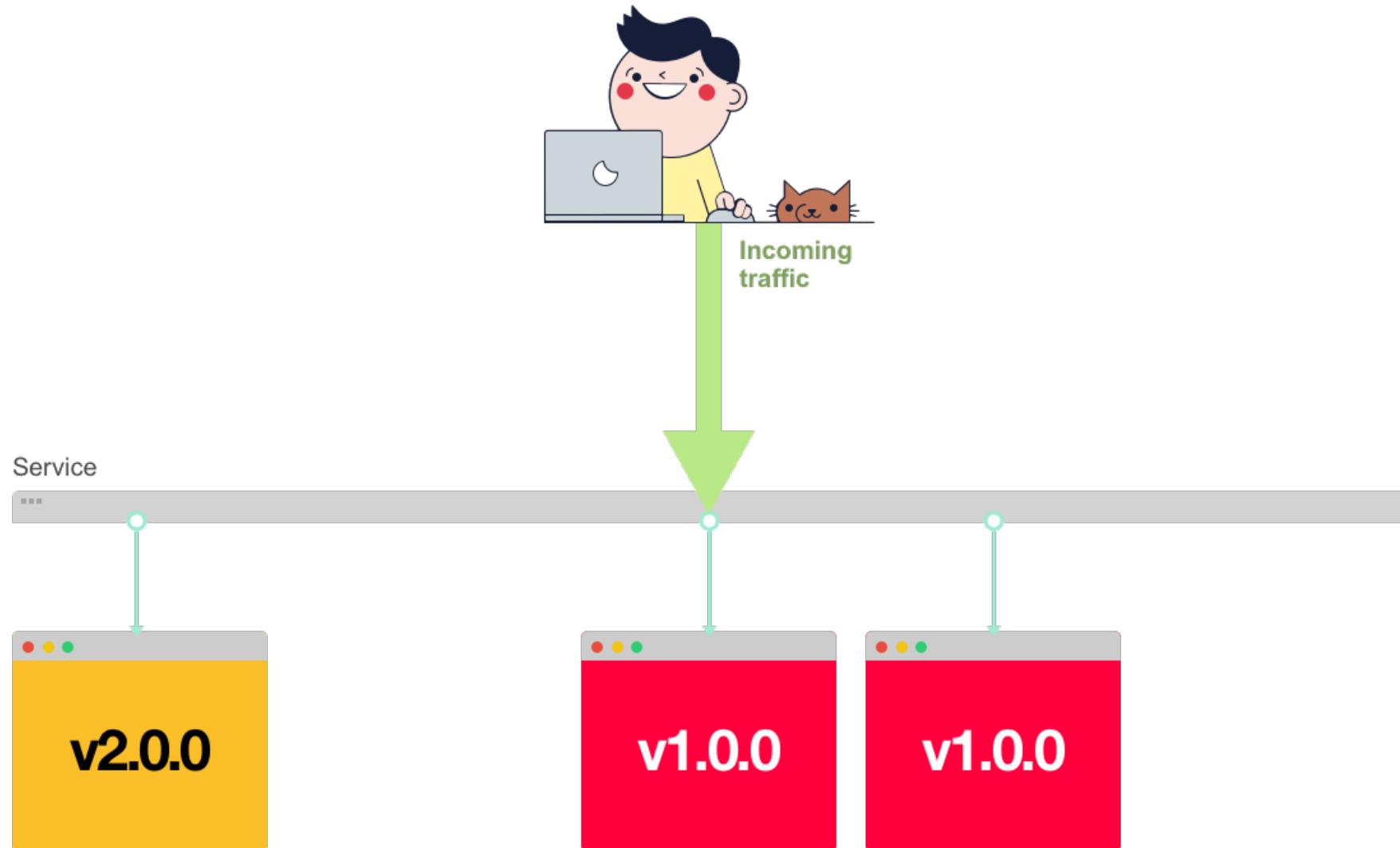


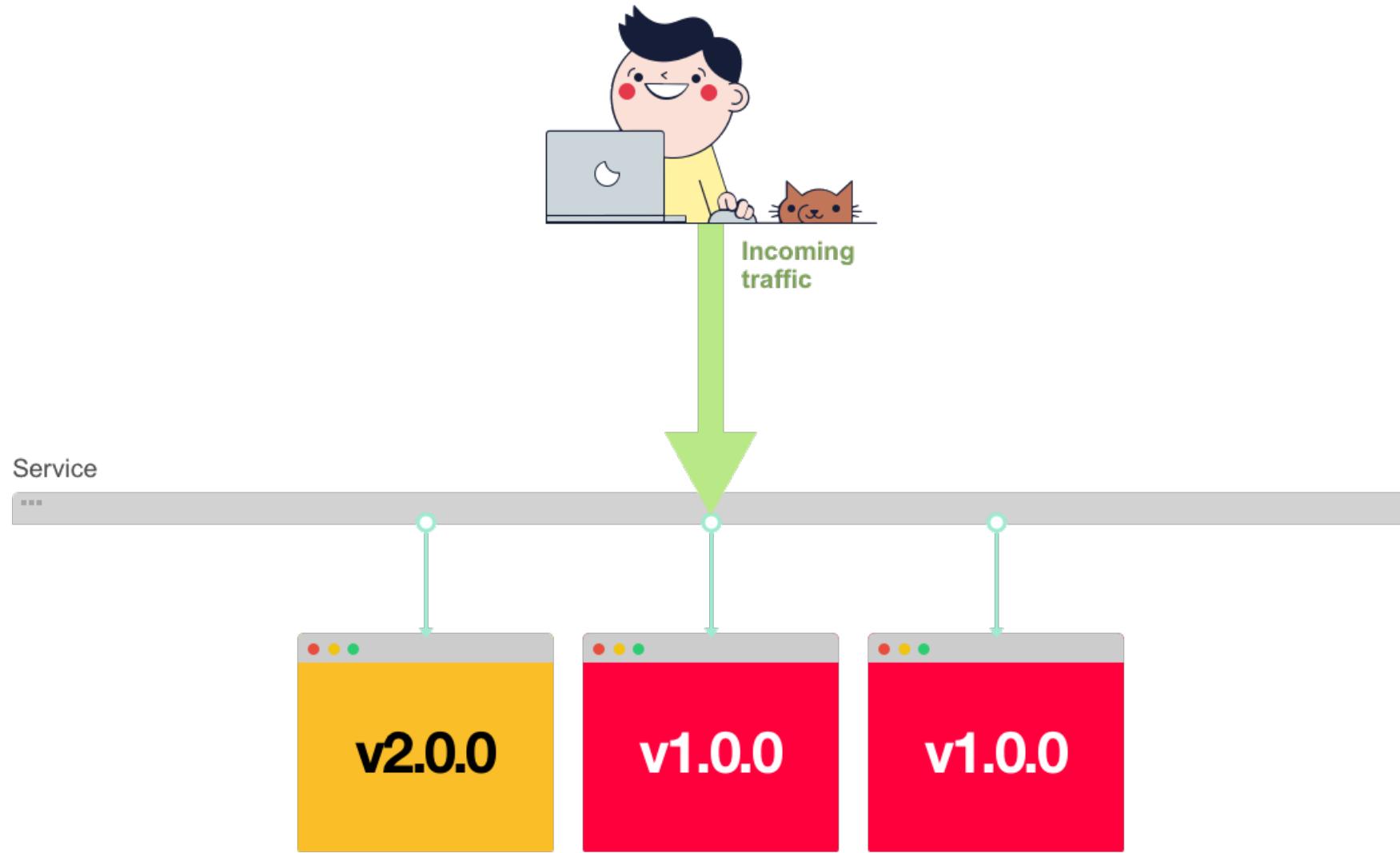


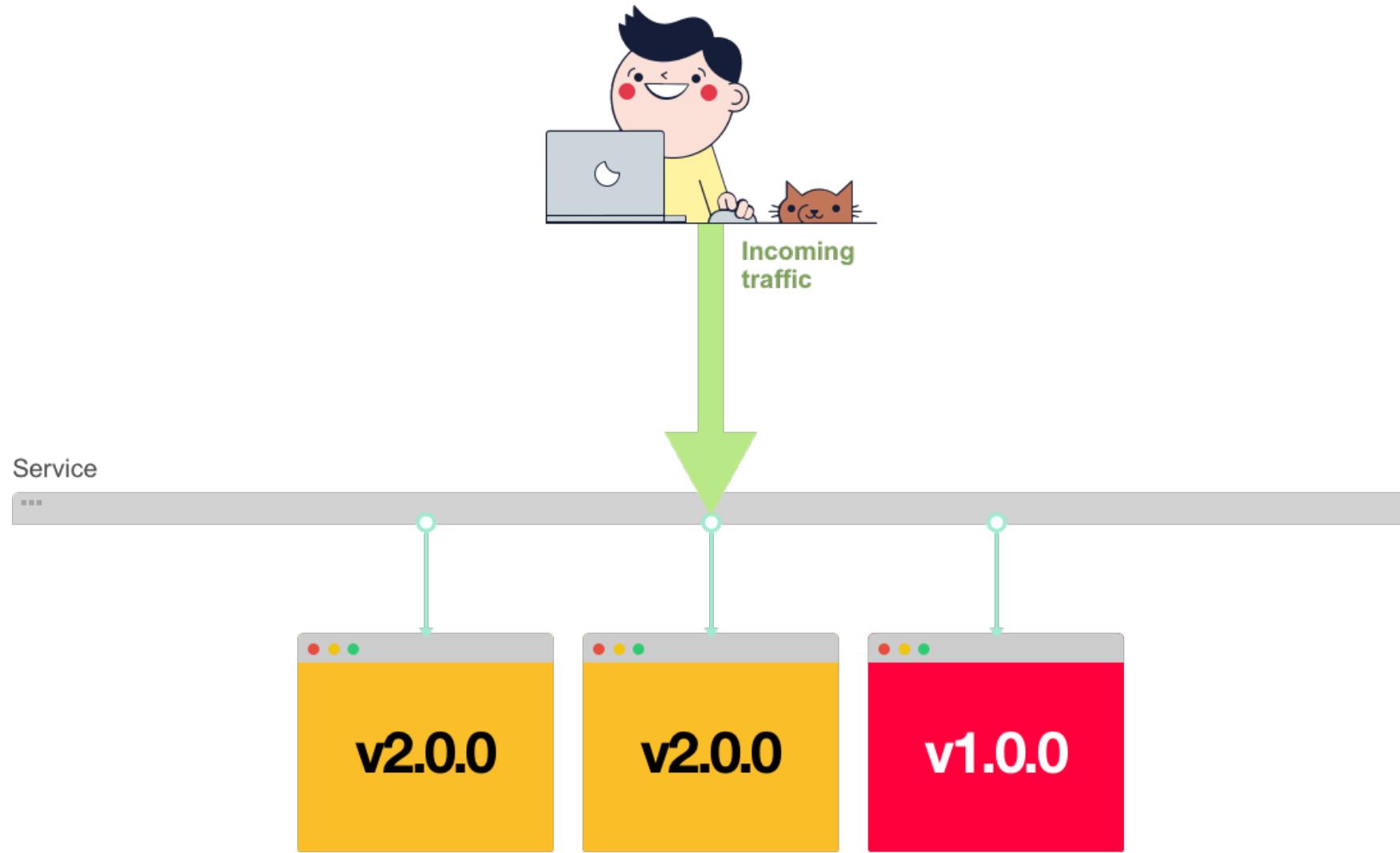
**Don't drop
connections**

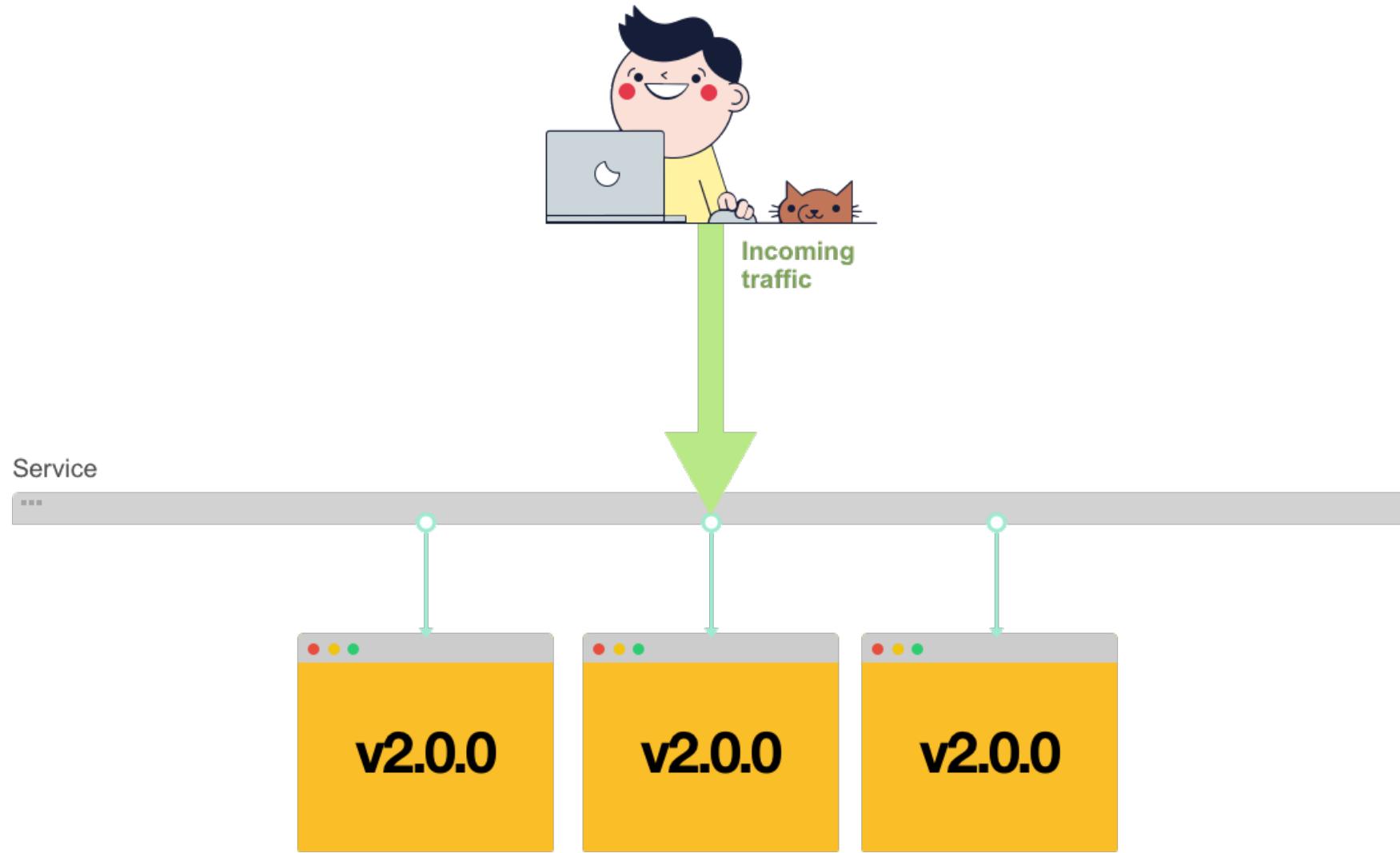




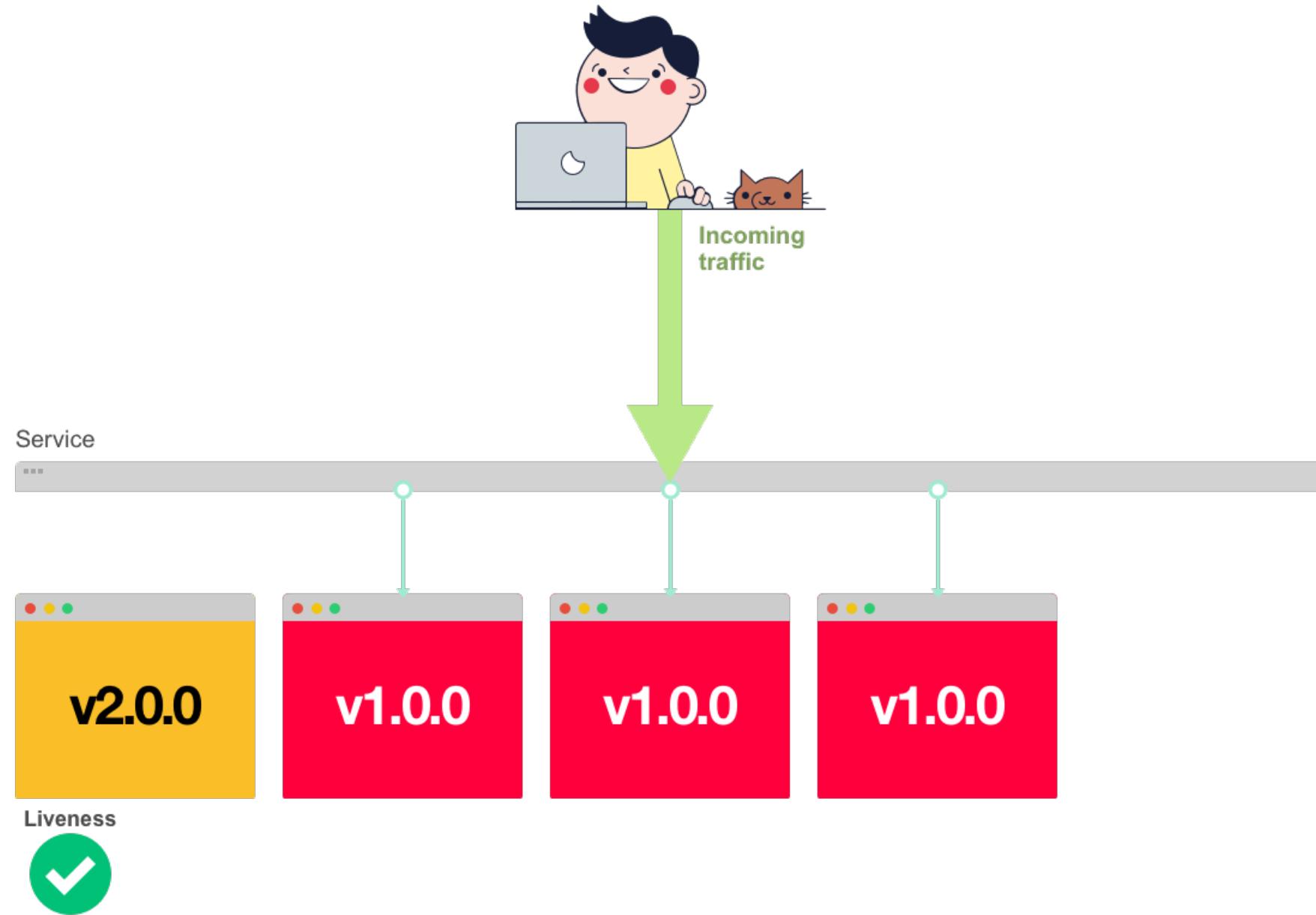


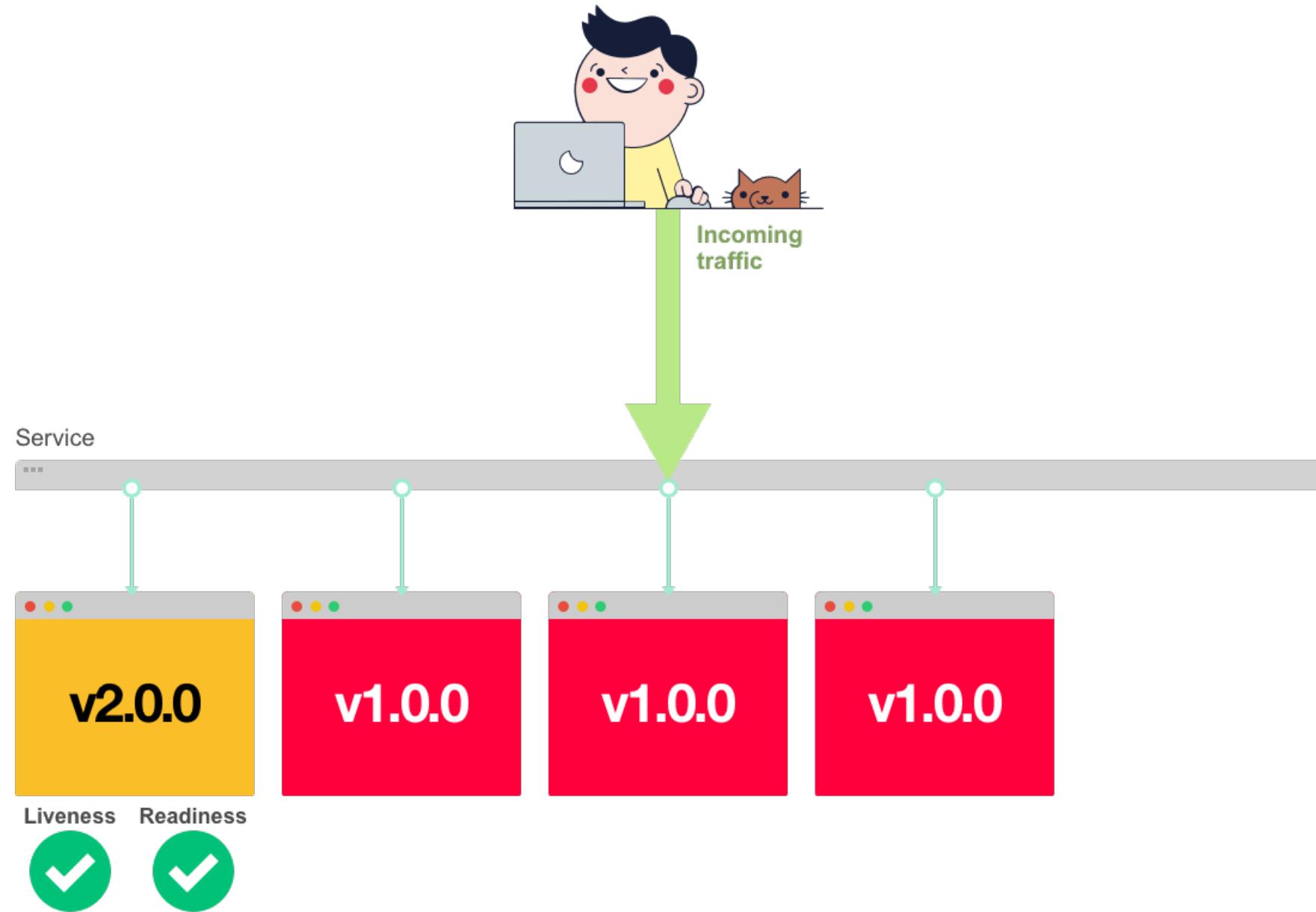


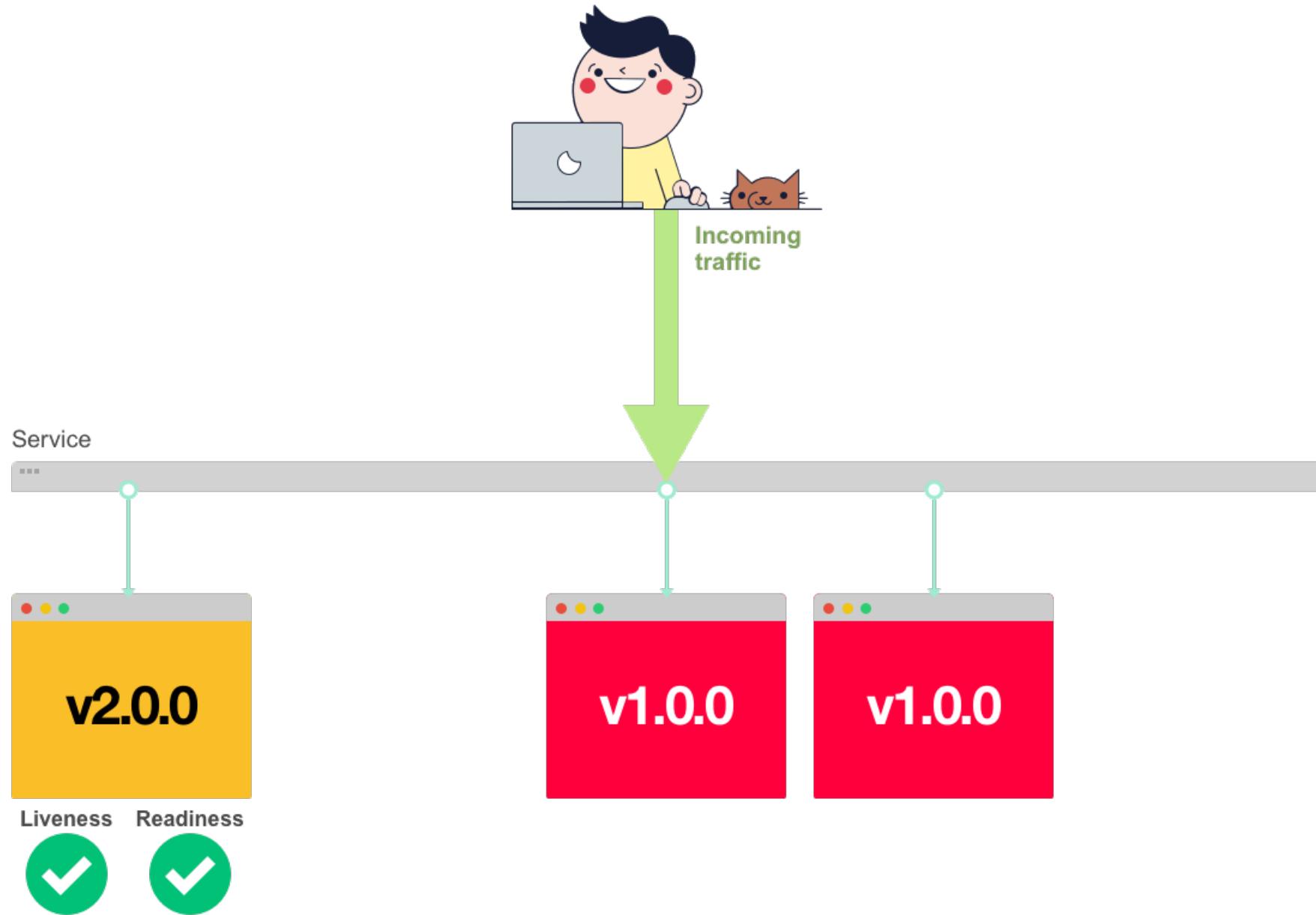


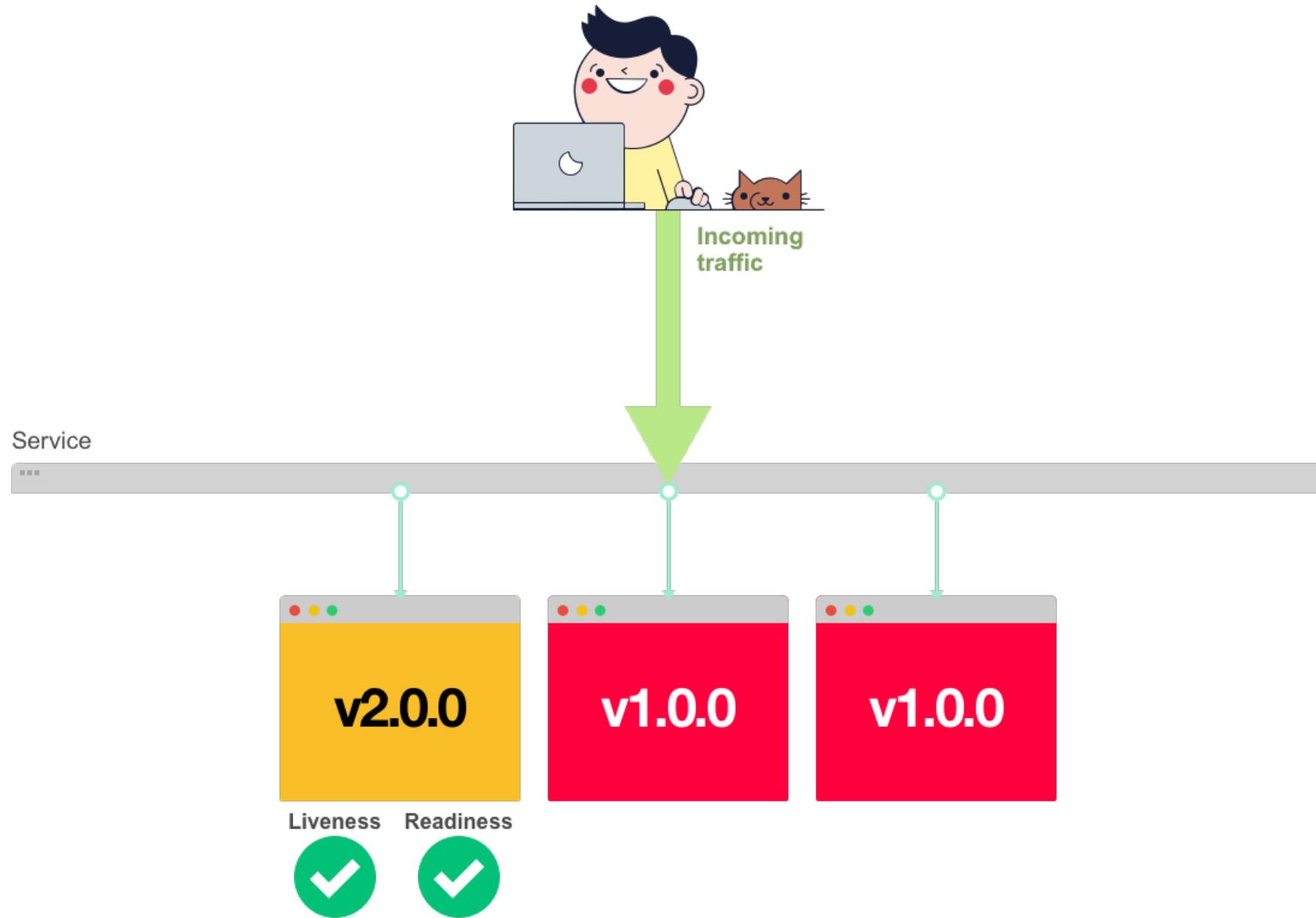


Readiness & Liveness probes











```
apiVersion: v1
kind: Pod
metadata:
  name: readiness-pod
spec:
  containers:
  - name: sise
    image: learnk8s/demo:1.0.0
    ports:
    - containerPort: 3000
  readinessProbe:
    initialDelaySeconds: 2
    periodSeconds: 5
    httpGet:
      path: /health
      port: 3000
```



Click'n'play



Google Cloud Platform



codefresh-staging ▾



DASHBOARD

ACTIVITY





Google Cloud Platform

Kubernetes Engine - bryk-gke

https://console.cloud.google.com/kubernetes/list?project=bryk-gke&template=standard-cluster

Create a Kubernetes cluster

Cluster templates

Select a template with preconfigured setting, or customize a template to suit your needs

- Clone an existing cluster
Select one of your existing clusters to populate fields
- Standard cluster
Continuous integration, web serving, backends. Best choice for further customization or if you are not sure what to choose.
- Your first cluster
Experimenting with Kubernetes Engine, deploying your first application. Affordable choice to get started.
- CPU intensive applications
Web crawling or anything else that requires more CPU.
- Memory intensive applications
Databases, analytics, things like Hadoop, Spark, ETL or anything else that requires more memory.
- GPU Accelerated Computing
Machine learning, video transcoding, scientific computations or anything else that is compute-intensive and can utilize GPUs.

'Standard cluster' template

Continuous integration, web serving, backends. Best choice for further customization or if you are not sure what to choose.

Some fields can't be changed after the cluster is created. Hover over the help icons to learn more.

Name

Location type Zonal
 Regional

Zone

Master version

Node pools

Node pools are separate instance groups running Kubernetes in a cluster. You may add node pools in different zones for higher availability, or add node pools of different type machines. To add a node pool, click Edit. [Learn more](#)

default-pool
Number of nodes <input type="text" value="3"/>
Machine type <input type="text" value="Customize to select cores, memory and GPUs"/>

Create **Cancel** Equivalent [REST](#) or [command line](#)

The screenshot shows the Google Cloud Platform interface with two main windows open.

Top Window: Create a Kubernetes cluster

- Left Sidebar:** Shows the Google Cloud Platform navigation bar with "Kubernetes Engine" selected under "Clusters". Other options include Workloads, Services, Applications, Configuration, and Storage.
- Content Area:** Title: "Create a Kubernetes cluster".
 - Cluster templates:** "Select a template with preconfigured setting, or customize a template to suit your needs".
 - Clone an existing cluster:** Select one of your existing clusters to populate fields.
 - Standard cluster:** Selected. Description: "Continuous integration, web serving, backends. Best choice for further customization or if you are not sure what to choose."
 - 'Standard cluster' template:** "Continuous integration, web serving, backends. Best choice for further customization or if you are not sure what to choose."
 - A note: "Some fields can't be changed after the cluster is created. Hover over the help icons to learn more." with a "Dismiss" button.
 - Form Fields:**
 - Name:** standard-cluster-2
 - Location type:** Zonal (selected)

EKS



Services ▾

Resource Groups



Services ▾

Resource Groups



Data

History

EKS

Console Home

IAM

Find a service by name



Compute

EC2

Search IAM

Dashboard

Groups

Users

Roles

Policies

Roles > eksServiceRole

Summary

Role ARN

arn:aws:iam::011173820421:role/eksServiceRole



Role description

Allows EKS to manage clusters on your behalf. | Edit

Instance Profile ARNs



Path

/

Creation time

2019-02-10 15:16 UTC+0200



Update cluster version

Delete

EKS-Testing-Cluster

General configuration

Kubernetes Version

1.11

Platform Version

eks.2

Status

ACTIVE

API server endpoint



<https://72009B88C160E08F072C2AA319AEA547.yl4.us-east-1.eks.amazonaws.com>

Certificate authority



LS0tLS1CRUdJTiBDRVJUSUZJQ0FURS0tLS0tCk1JSUN5RENDQWJDZ0F3SUJBZ0lCQUKBTkJna3Foa2lHOXcwQkFRc0ZBREFWTVJNd0VRWURWUVFERXdwcmRXSmwKY201bGRHVnpNQjRYRFRFNU

AKS

Create Kubernetes cluster

Basics Networking Monitoring Tags Review + create

Azure Kubernetes Service (AKS) manages your hosted Kubernetes environment, making containerized applications without container orchestration expertise. It also eliminates maintenance by provisioning, upgrading, and scaling resources on demand, without taking away the power of Kubernetes.

[Azure Kubernetes Service](#)

PROJECT DETAILS

Select a subscription to manage deployed resources and costs. Use resource groups to organize your resources.

* Subscription [i](#)

1 Azure Pass

Create new Use existing

* Resource group [i](#)

2 coolapp

CLUSTER DETAILS

* Kubernetes cluster name [i](#)

3 coolk8s

* Region [i](#)

4 East US

* Kubernetes version [i](#)

5 1.9.6

* DNS name prefix [i](#)

6 coolk8s

+ Create a resource

All services

★ FAVORITES

Dashboard

Azure Cosmos DB

Subscriptions

Rene Azure Sponsorship - Resource providers

Rene Azure Sponsorship - Resource providers
Subscription

Search (Ctrl+ /)

Overview

Access control (IAM)

Diagnose and solve problems

SETTINGS

Programmatic deployment

Resource groups

Resources

Usage + quotas

Policies

Management certificates

My permissions

Resource providers

aks-cluster
Container service (managed) - PREVIEW

Move Delete Refresh

Resource group (change)

Location East US

Subscription (change)

Subscription ID

Search (Ctrl+ /)

Overview

Activity log

Access control (IAM)

Tags

Subscriptions		Refresh
Rene Azure Sponsorship - Resource providers	Subscription	<input type="button" value="Re-register"/>
Rene Azure Sponsorship - Resource providers	Subscription	<input type="button" value="Re-register"/>
coolapp	Provider	<input type="button" value="Re-register"/>
Microsoft ContainerInstance	Status	Registered
Microsoft ContainerRegistry	Status	Registered
Microsoft ContainerService	Status	Registered

1. sync changes manually

1. sync changes manually

2. harder to create more clusters

1. sync changes manually

2. harder to create more clusters

3. time to market



HashiCorp

Terraform



bash

```
$ cd dev  
$ terraform apply -var 'nodes=10'
```



bash

```
$ cd prod  
$ terraform apply -var 'nodes=50'
```

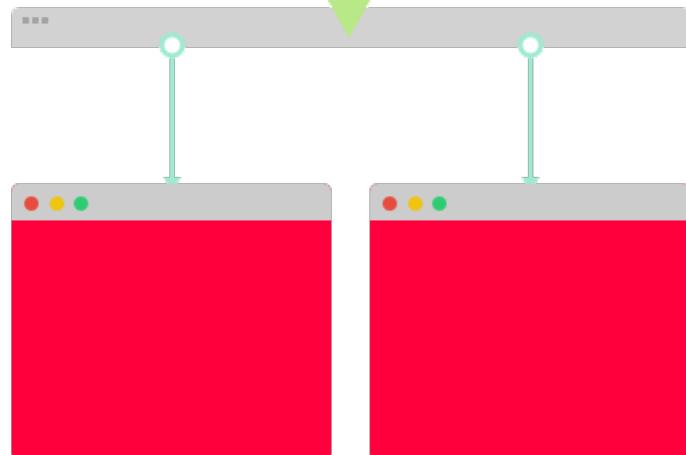


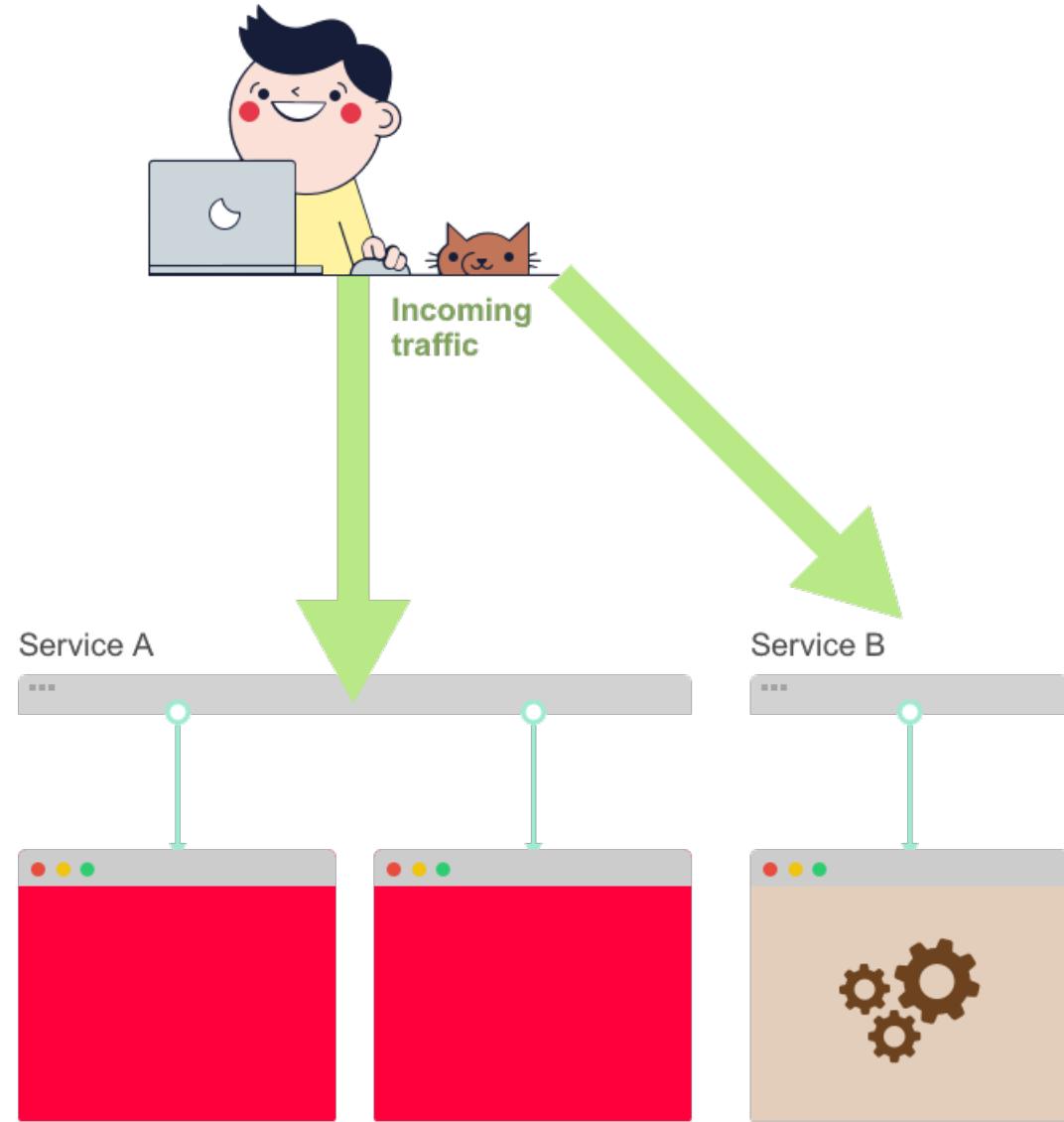
Exposing services

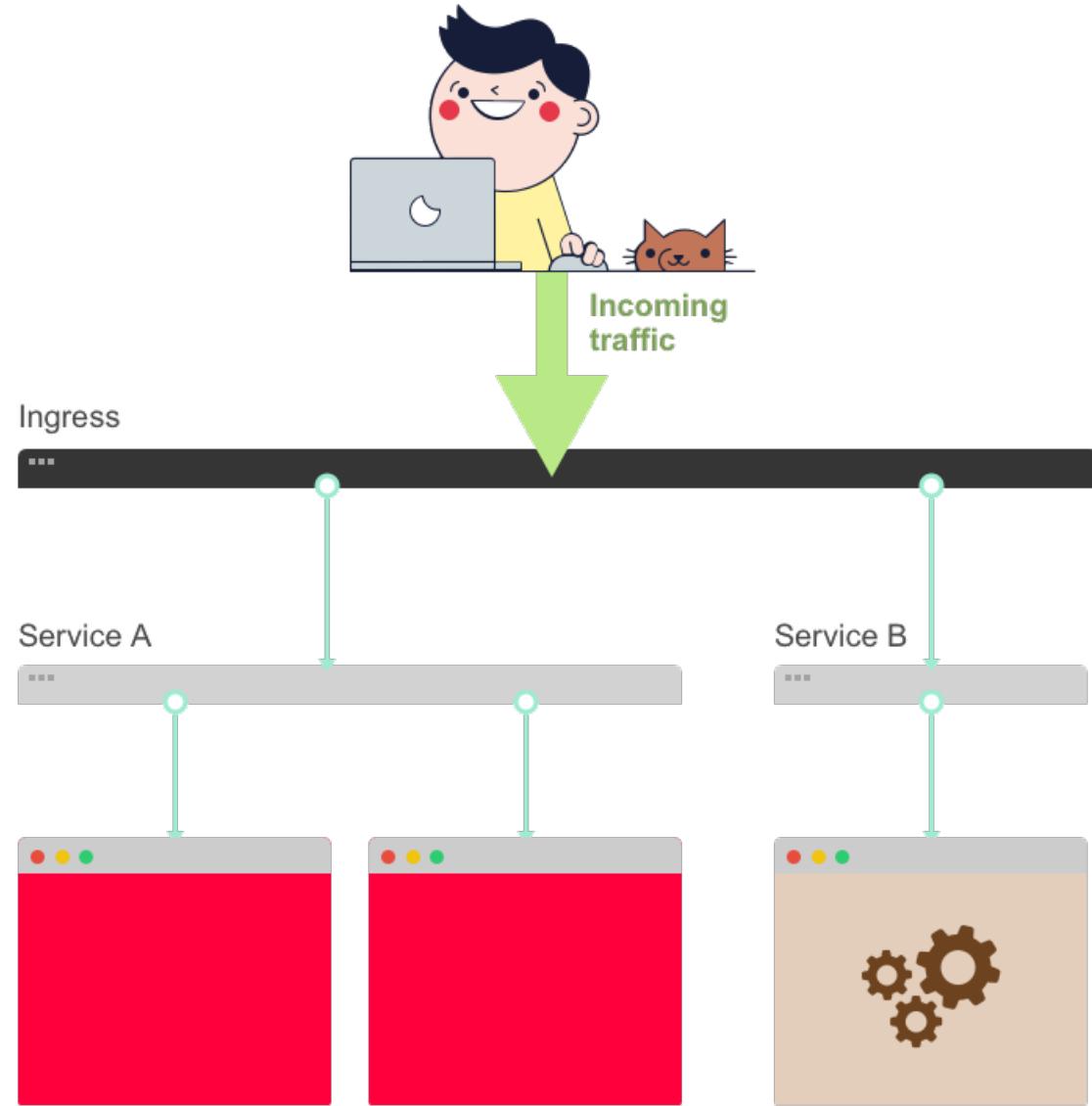


Incoming traffic

Service

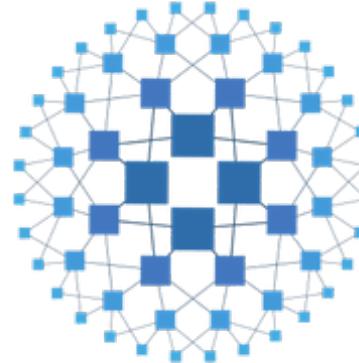






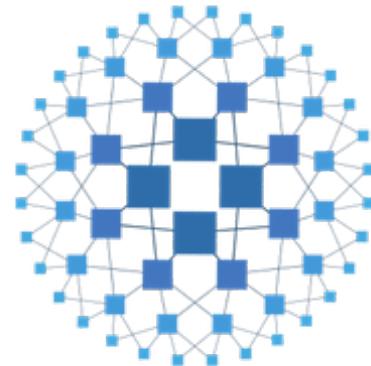
NGINX

NGINX



HAPROXY

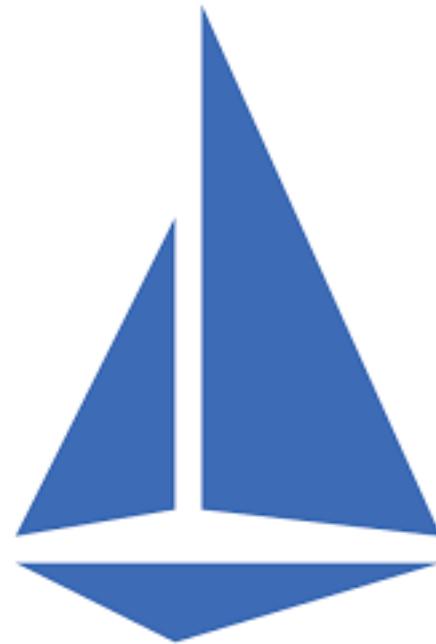
NGINX



HAPROXY



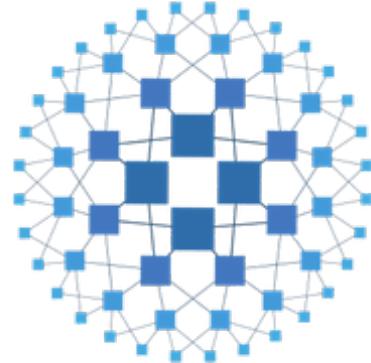
Gloo^o



Istio



NGINX



HAPROXY



Gloo

https://kubedex.com/ingress/

Chrome File Edit View History Bookmarks People Window Help

2 KB/s 87 KB/s i 0:28 17:19

DEV Y TC J N G D 36 G +

https://docs.google.com/spreadsheets/d/16bxRgpO1H_Bn-5xVZ1WrR_I-0A-GOI6egmhvqqLMOmg/edit#gid=1612037324

Kubernetes Ingress  Share

File Edit View Insert Format Data Tools Add-ons Help

Comment only 100%

Citrix Ingress Controller

	A	B	C	D	E	F	G	H	I
1	backend service discovery	ingress-nginx	kong	traefik	haproxy	voyager	contour	ambassador	istio ingi
2	protocol	http,https,tcp (separate lb),udp/grpc	http,https, grpc	http,https,grpc,tcp + tls (alpha)	http,tcp	http,https,tcp	http,https,tcp,grpc	http,https,grpc,tcp, tcp+ssl/tls,udp	tcp,http,https
3	based on	nginx	kong + nginx	traefik	haproxy	haproxy	envoy	envoy	envoy
4	ssl termination	yes	yes	yes	yes	yes	yes	yes	yes
5	websocket	yes	yes	yes	yes	yes	yes	yes	yes
6	routing	host,path(with regex)	host,path,method,header(ent erprise)	host,path	host,path	host,path	host,path	host,header,path	host,us
7	scope	cross-namespace	namespace	cross-namespace	optional cross-namespace	cross-namespace	cross namespace	cross-namespace	cross-name
8	resiliency	rate limit, retries	active and passive health check, circuit break, rate limit, retries	circuit break, retries	-	-	retries	rate limit	circuit break
9	lb algorithms	rr,ewma,ip_hash	rr, hash based	rr, wrr	rr, srr, leastconn,first,source,uri, url_param,hdr,rdp-cookie	rr	wrr,wlr,ring hash, maglev, random	wrr	rr,leastconn,random
10	auth	basic, digest, external auth	Basic Auth, HMAC, JWT, Key, LDAP, OAuth 2.0, PASETO, plus paid Kong Enterprise options like OpenID Connect	basic, digest and forward auth in alpha	basic	basic,oauth	-	yes	JWT
11	Tracing	yes	yes	yes	-	-	-	yes	yes
12	canary/shadow	canary	canary	canary	-	-	canary	canary,shadow	canary,sh
13	istio integration	-	-	-	-	-	-	yes	yes
14	state	kubernetes	kubernetes	kubernetes	kubernetes	kubernetes	kubernetes	kubernetes	kuberne
15	paid support	-	yes	yes	yes	yes	-	yes	-
16					https://www.haproxy.com				



Automate Governance

1. validate schema

1. validate schema

2. enforce best practice

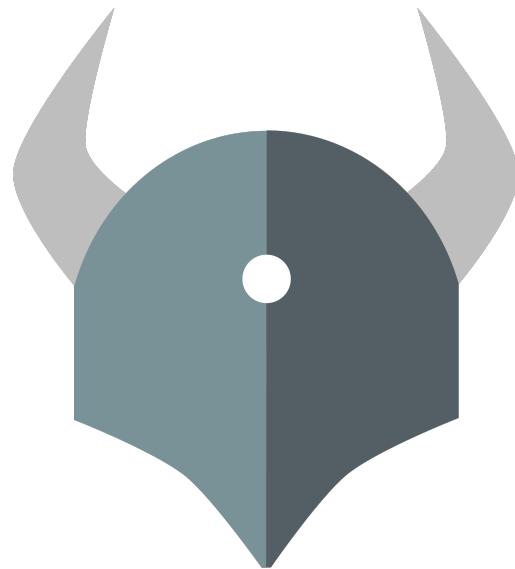
1. validate schema
2. enforce best practice
- 3. standardise YAML**

1. validate schema

2. enforce best practice

3. standardise YAML

4. catch errors earlier



Open Policy Agent



Copper

Kubeval

`kubeval` is a tool for validating a Kubernetes YAML or JSON configuration file. It does so using schemas generated from the Kubernetes OpenAPI specification, and therefore can validate schemas for multiple versions of Kubernetes.

[go report](#) [A+](#) [godoc](#) [reference](#)

```
$ kubeval my-invalid-rc.yaml
The document my-invalid-rc.yaml contains an invalid ReplicationController
--> spec.replicas: Invalid type. Expected: integer, given: string
$ echo $?
1
```

For full usage and installation instructions see kubeval.instrumenta.dev.



Make new friends











learnk8s

Thanks!
