(📖) Quoi De Neuf Avec Traefik 2.0, Le Edge Router À 1 Milliard De Téléchargements?

Toulouse Devops Meetup - 2019

How To Use These Slides?

- Browse the slides: Use the arrows
  - Change chapter: Left/Right arrows
  - Next or previous slide: Top and bottom arrows
- Overview of the slides: keyboard's shortcut "`o`"
- Speaker mode (and notes): keyboard's shortcut "`s`"

Whoami

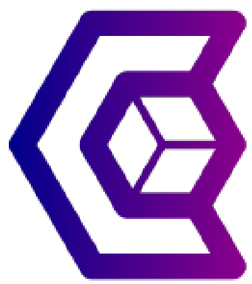
Jean-Baptiste Doumenjou

- 📖 Developer
- Maintainer of Træfik
- @jbdoumenjou
- jbdoumenjou

Containous

https://containo.us

- We Believe in Open Source
- We Deliver Traefik and Traefik Enterprise Edition
- Commercial Support
- 30 people distributed, 90% tech



Why Traefik?

Why, Mr Anderson?

THE EVOLUTION OF

SOFTWARE ARCHITECTURE

1990's

SPAGHETTI-ORIENTED
ARCHITECTURE
(aka Copy & Paste)

2000's

LASAGNA-ORIENTED
ARCHITECTURE
(aka Layered Monolith)

2010's

RAVIOLI-ORIENTED
ARCHITECTURE
(aka Microservices)

WHAT'S NEXT?

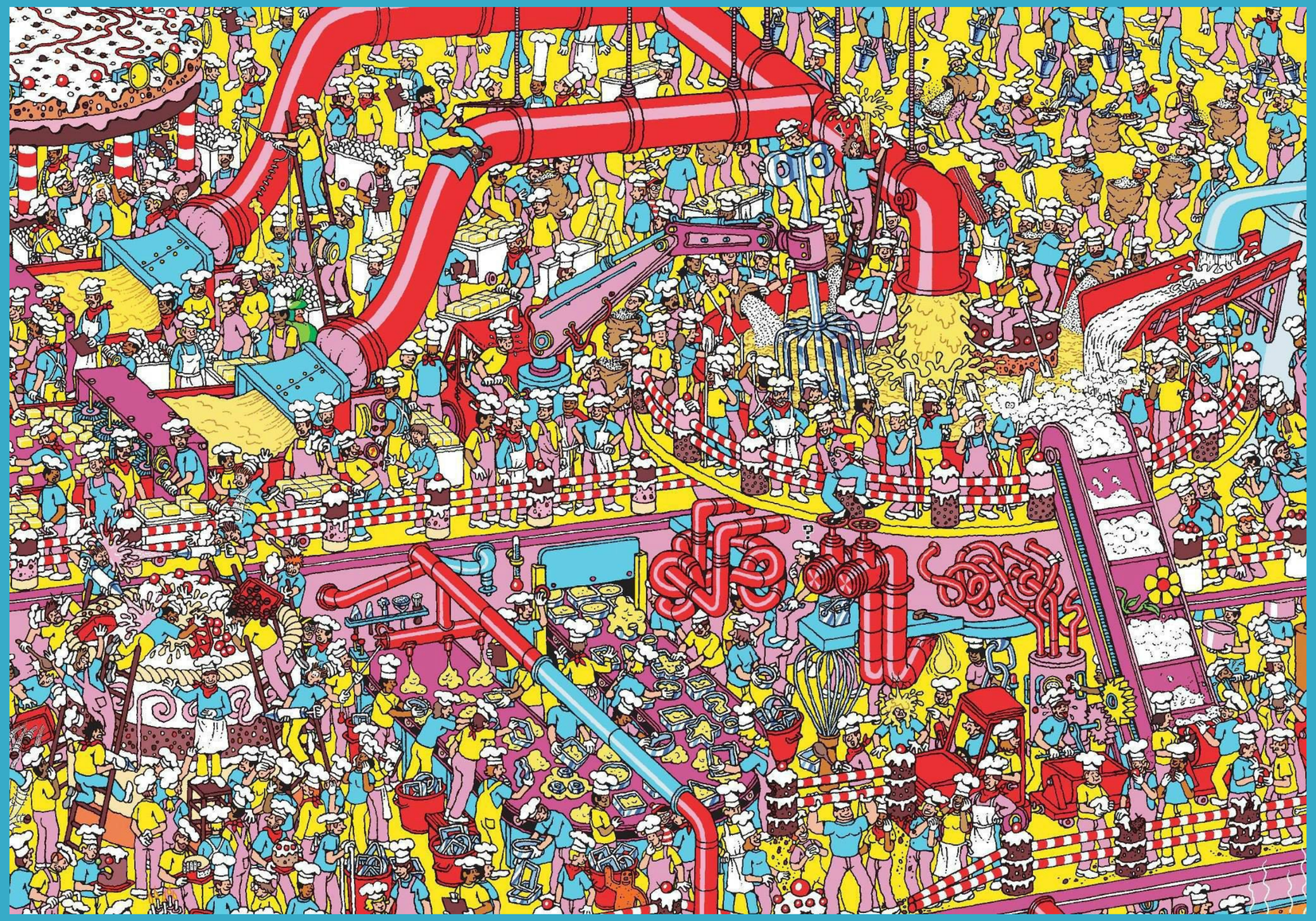
PROBABLY PIZZA-ORIENTED ARCHITECTURE

By @benorama

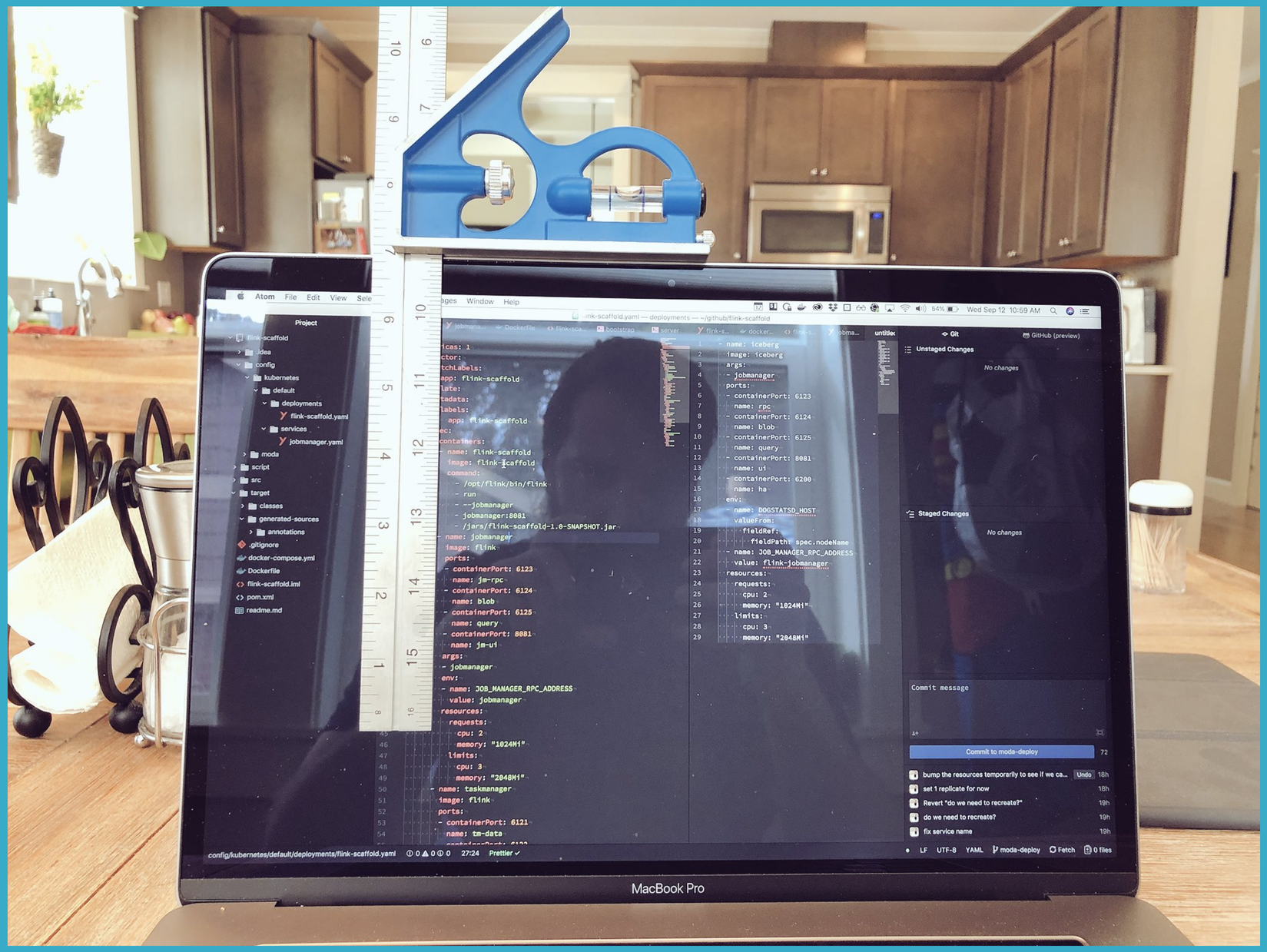
The Premise Of Microservices…

⋯And What Happens

Where’s My Service?



Tools Of The Trade

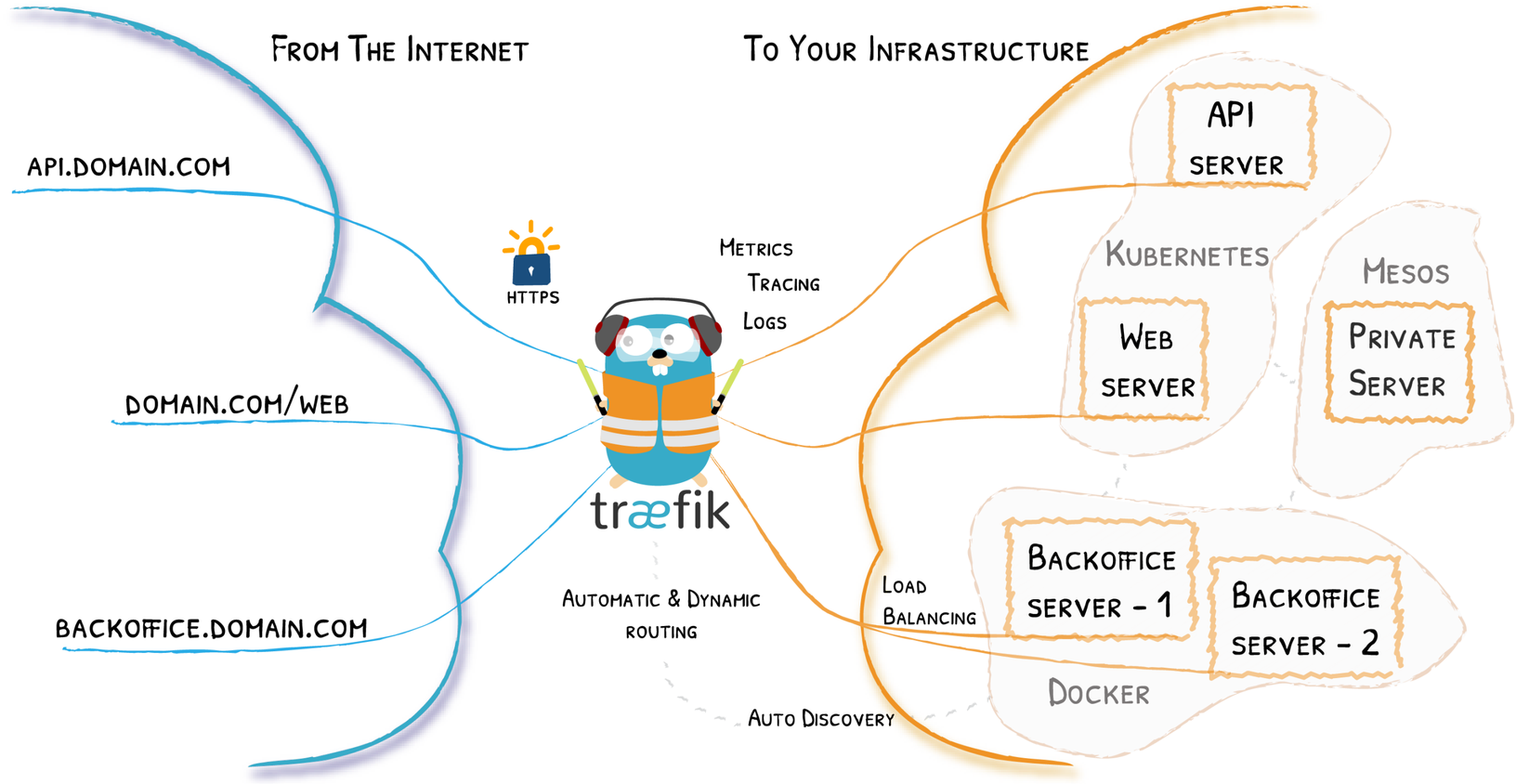


Source: https://twitter.com/Caged/status/1039937162769096704

What If I Told You?

That You Don’t Have to Write This Configuration File…?

Here Comes Traefik!



Traefik Project

- https://github.com/containous/traefik
- MIT License
- Written in Go
- 24,000+ ☆ 1B+ ⬇ 400+ 👷
- Created in 2015, 4Y 🎂
- Current stable branch: `v2.0`

BACK TO TRAEFIK PART 2.0

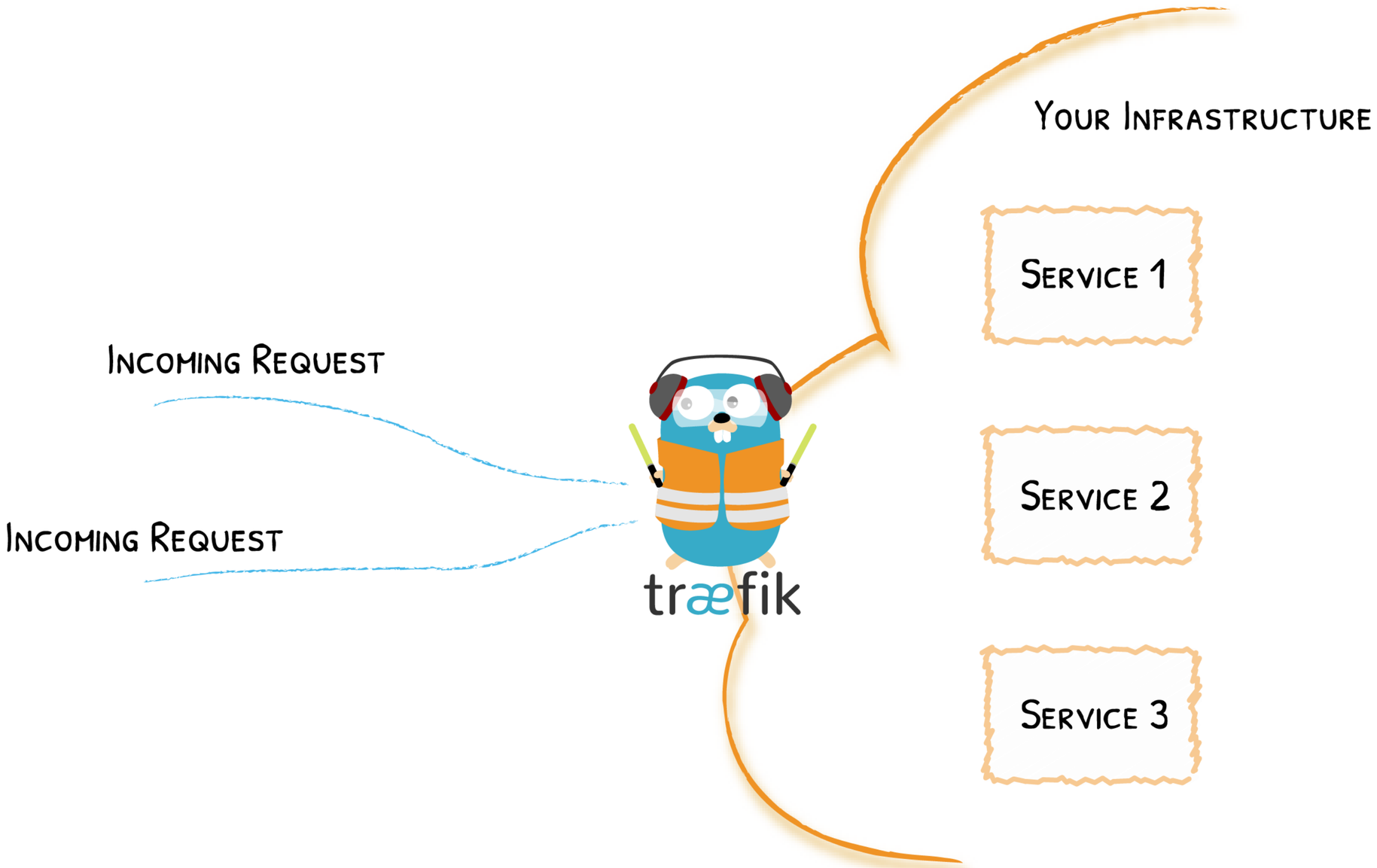
Traefik 2.0 Quick Overview

- Revamped Documentation
- Clarified Concepts
- Expressive Routing Rule Syntax
- Middlewares
- TCP Support
- Canary / Mirroring
- And so Much More…

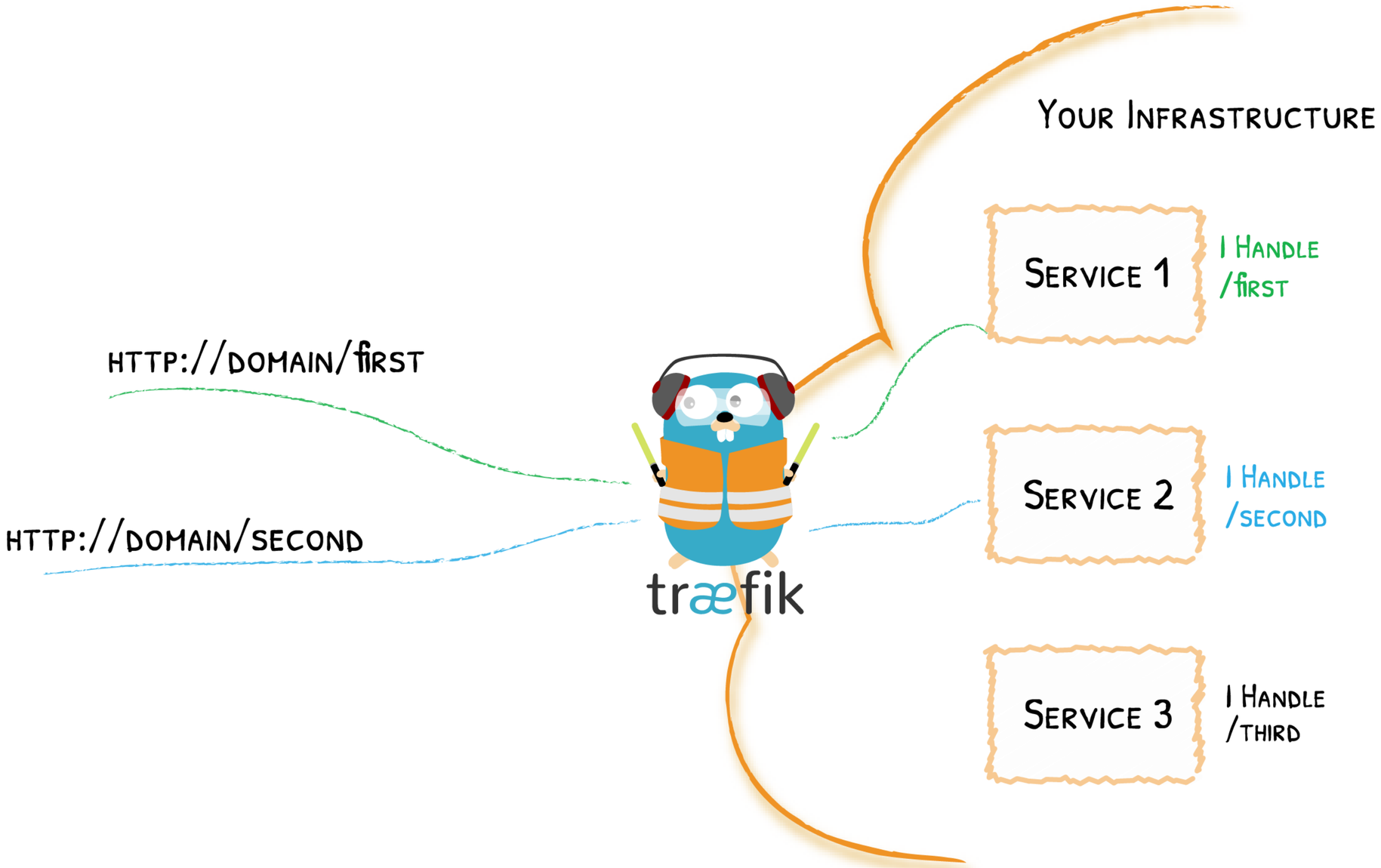
Learn more on the blog post

Traefik (V2.0) Core Concepts

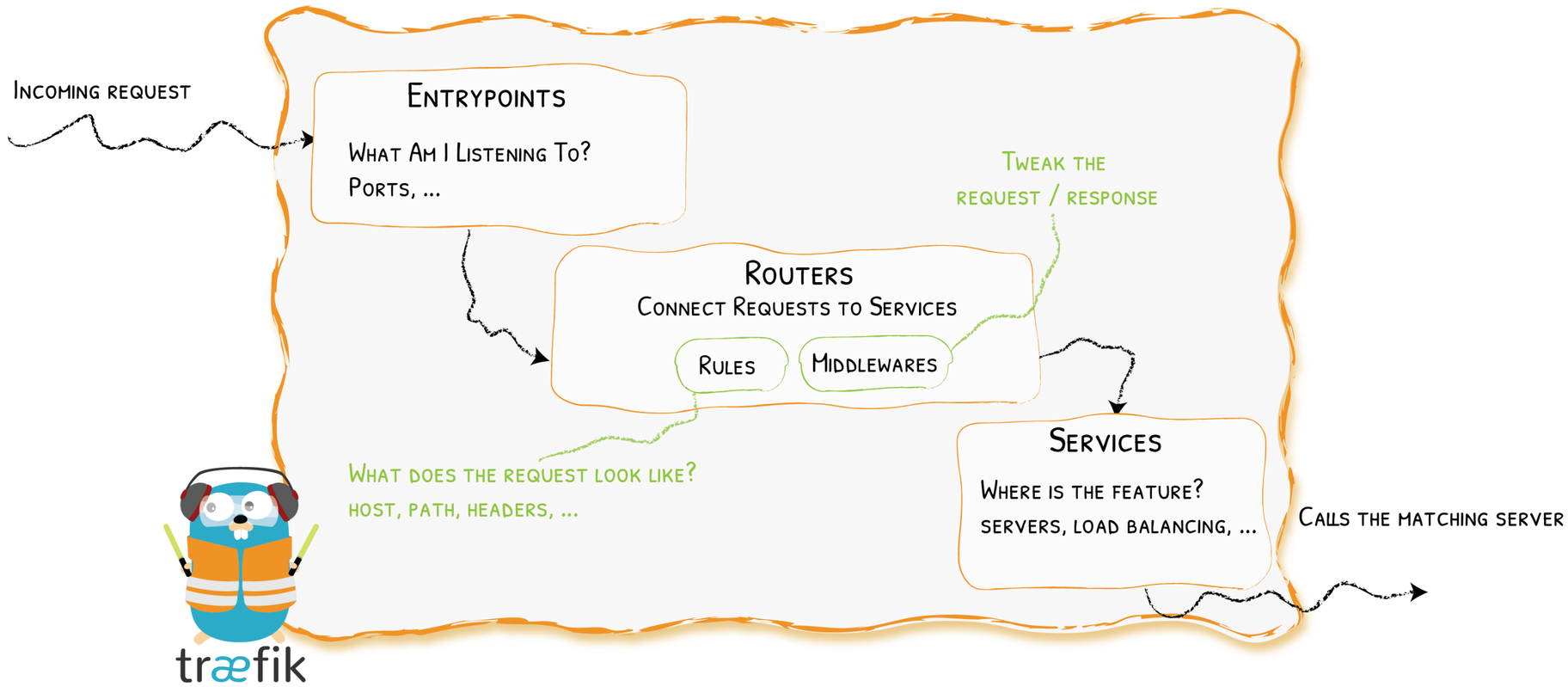
Traefik Is An Edge Router



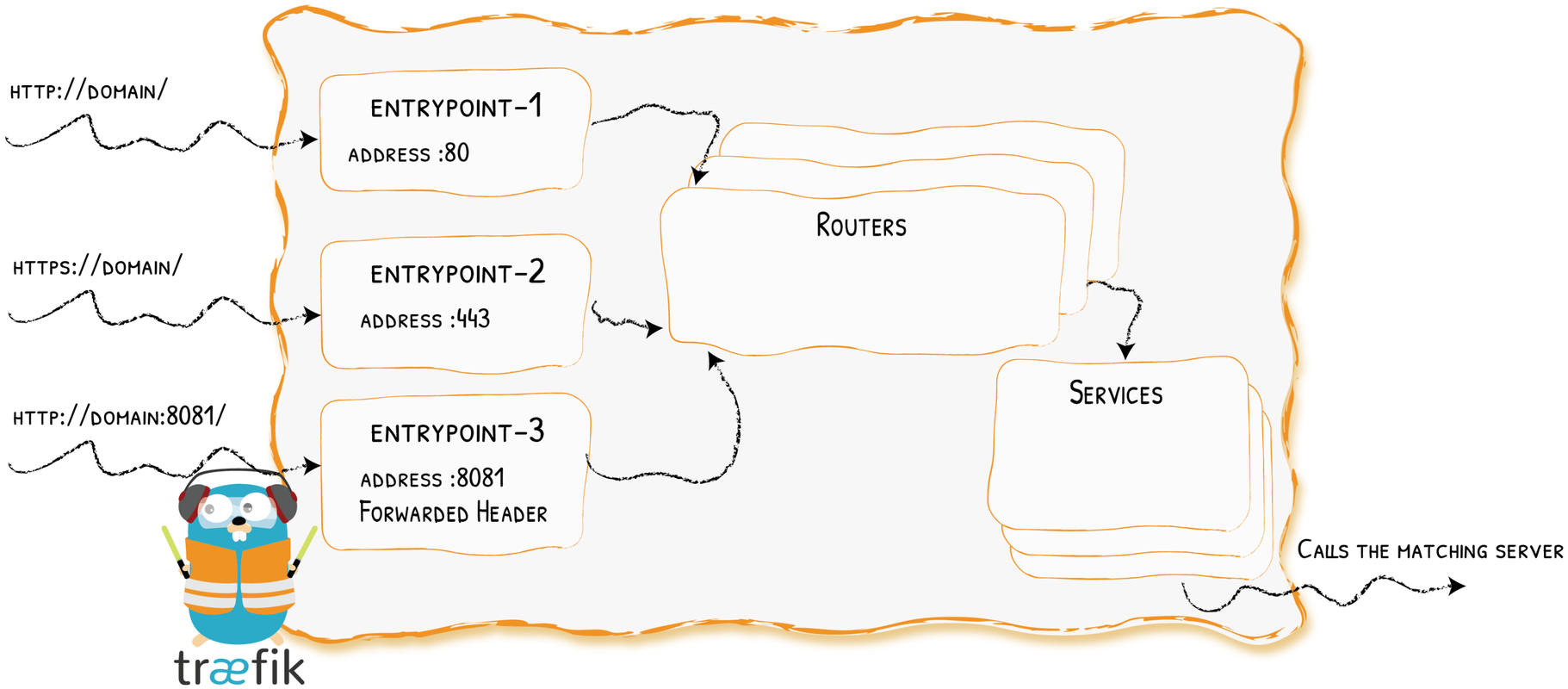
Dynamically Discovers Services



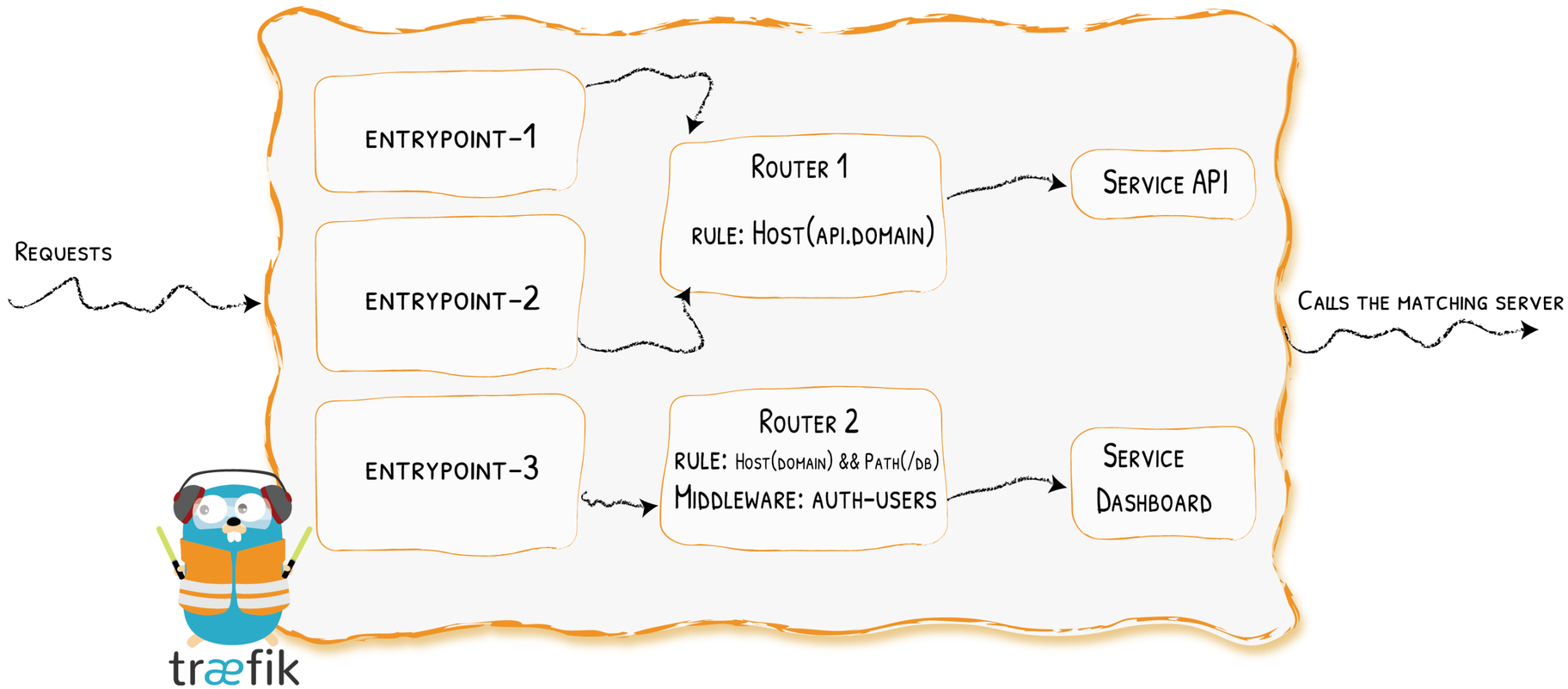
Architecture (V2.0) At A Glance



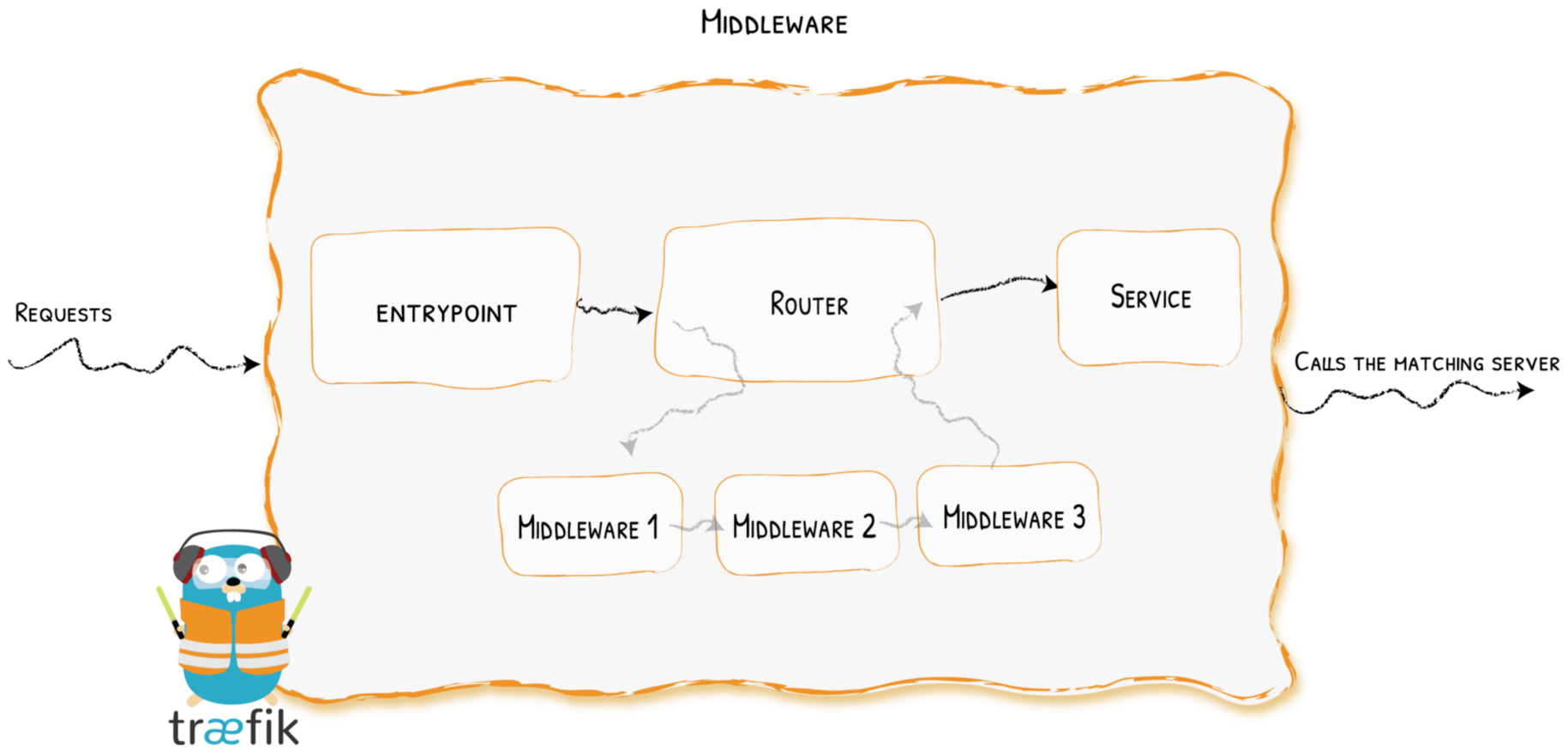
Entrypoints



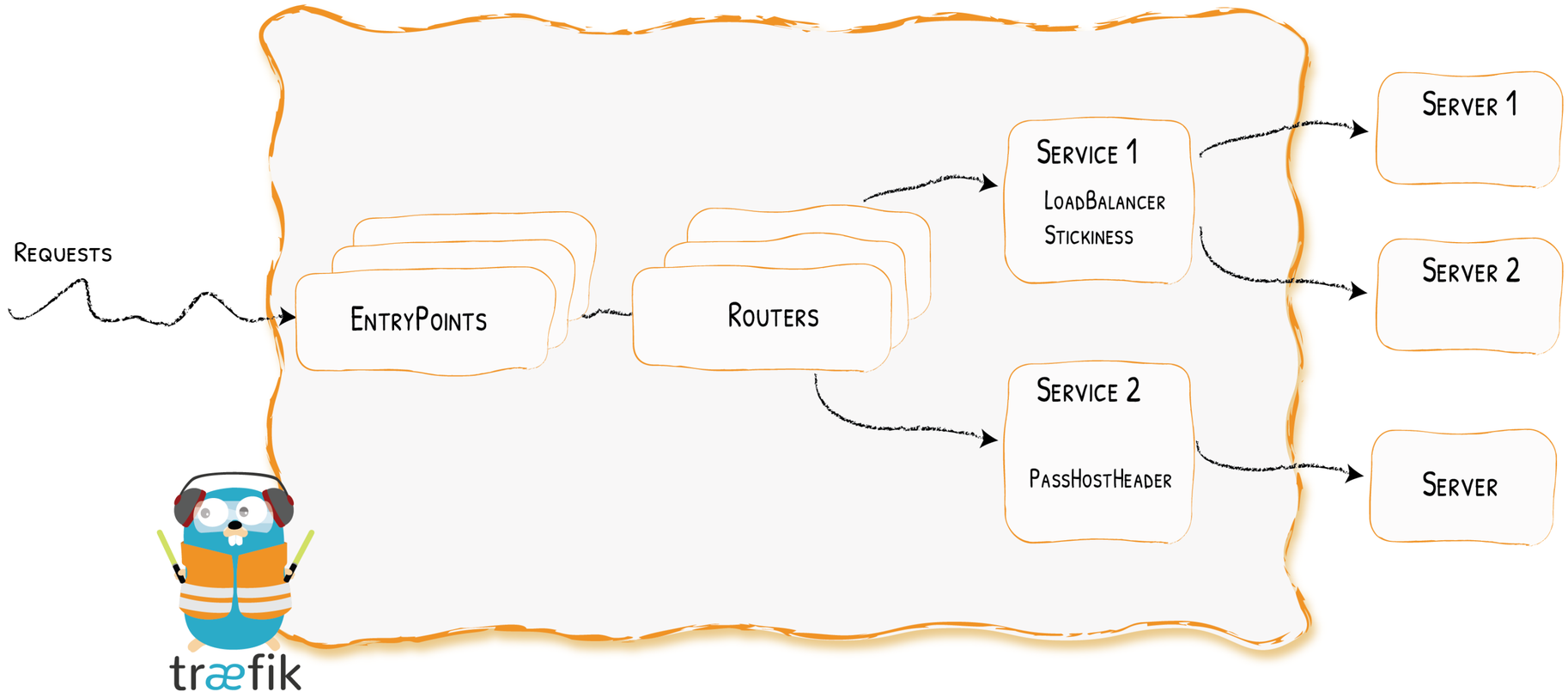
Routers


ENTRYPOINT-1
ROUTER 1
RULE: HOST(API.DOMAIN)
SERVICE API
REQUESTS
ENTRYPOINT-2
CALLS THE MATCHING SERVER
ENTRYPOINT-3
ROUTER 2
RULE: HOST(DOMAIN) && PATH(/DB)
MIDDLEWARE: AUTH-USERS
SERVICE
DASHBOARD
træfik

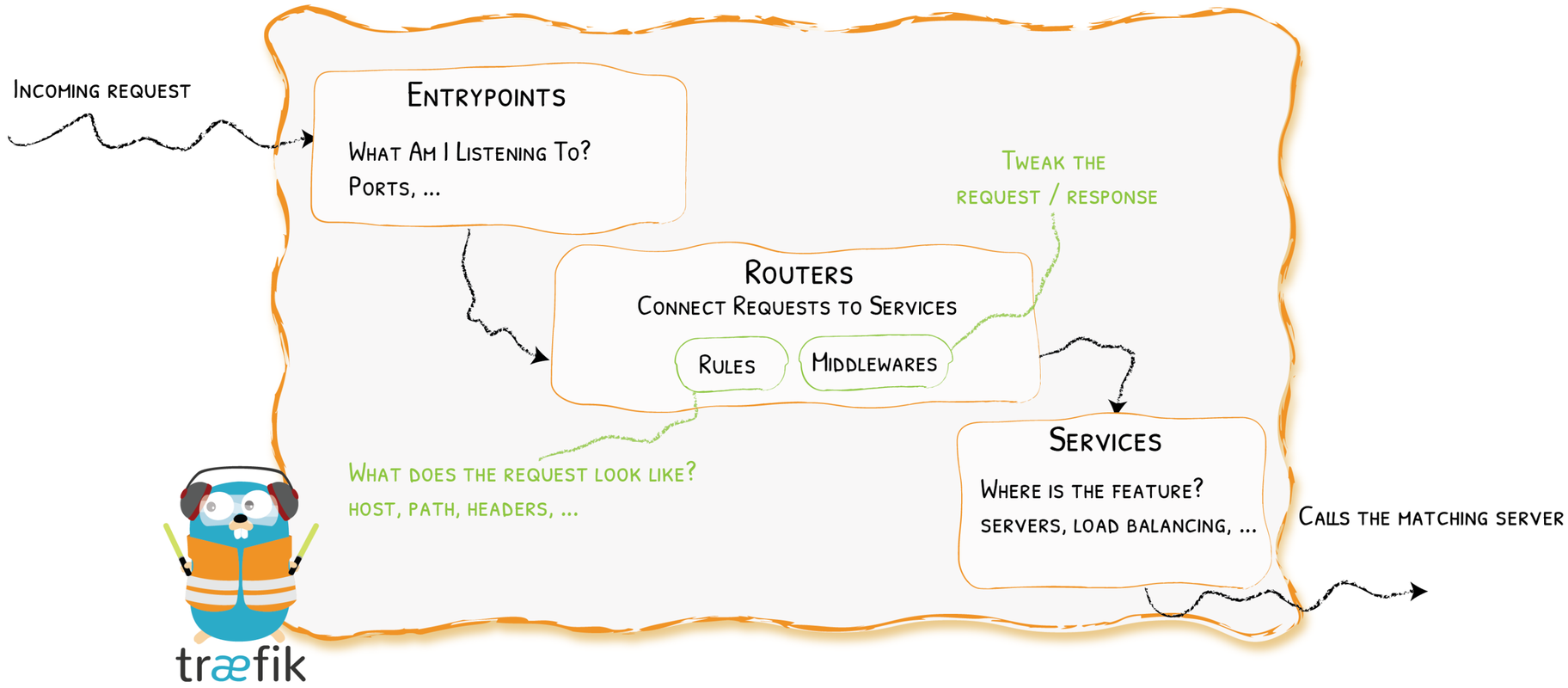
Middlewares



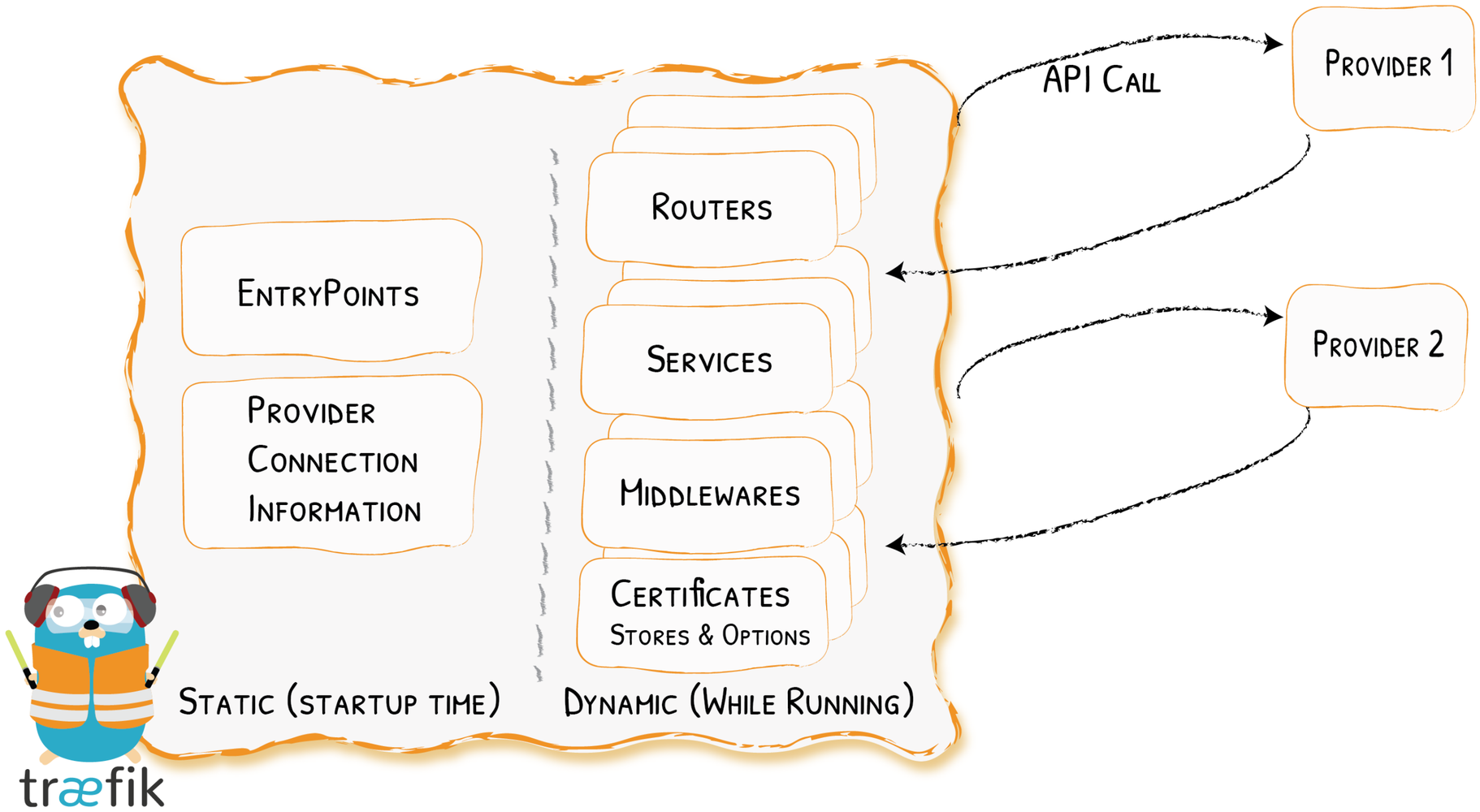
Services


Requests
EntryPoints
Routers
Service 1
LoadBalancer
Stickiness
Service 2
PassHostHeader
Server 1
Server 2
Server
træfik

Architecture (Again) At A Glance

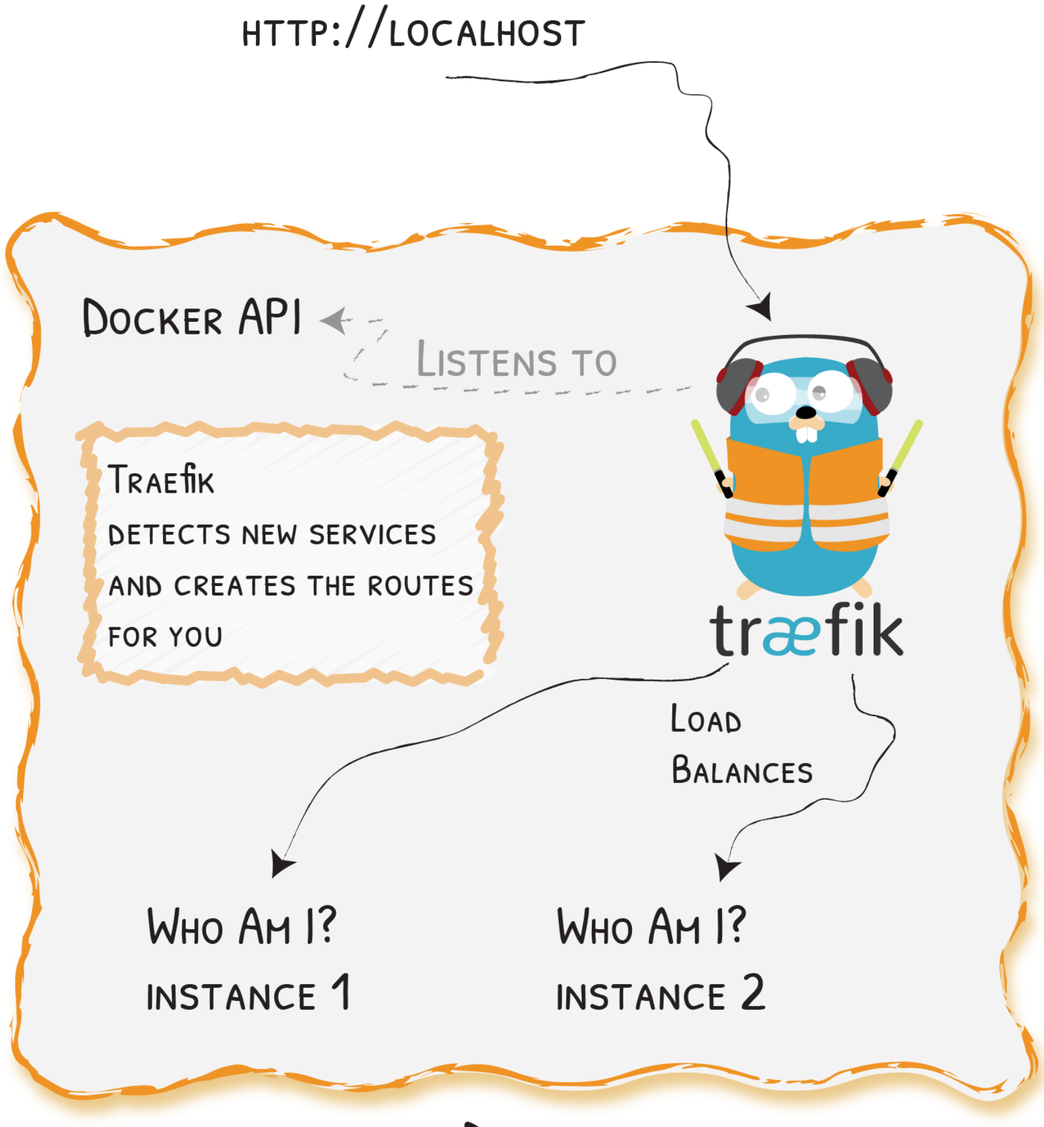


Static & Dynamic Configuration



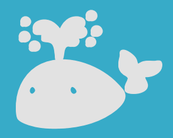
Show Me The Configuration!

Simple Example With



TRAEFIK IS THE ONLY ACCESSIBLE CONTAINER FROM THE OUTSIDE.

OTHER SERVICES ARE DEPLOYED ON DEMAND AND AVAILABLE THROUGHT TRAEFIK.

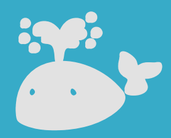
With 

- With Docker Compose:

```yaml
version: '3'

services:
  reverse-proxy:
    image: traefik:v2.0
    command: --providers.docker
    ports:
      - "80:80"
    volumes:
      - /var/run/docker.sock:/var/run/docker.sock

  webapp:
    image: containous/whoami
    labels:
      - "traefik.http.routers.webapp.rule=Host(`localhost`)"
```

With  : Context

```
# http://mycompany.org/jenkins -> http://jenkins:8080/jenkins
jenkins:
    image: jenkins/jenkins:lts
    environment:
      - JENKINS_OPTS=--prefix=/jenkins
    labels:
      - "traefik.http.services.jenkins.LoadBalancer.server.Port=8080" # Because 50000 is also exposed
      - "traefik.http.routers.jenkins.rule=Host(`mycompany.org`) && PathPrefix(`/jenkins`)"
      - "traefik.http.routers.jenkins.service=jenkins"
```

With 🐳: Rewrites

```
# http://mycompany.org/gitserver -> http://[container IP]:3000
gitserver:
    image: gitea/gitea
    labels:
      - "traefik.http.routers.gitserver.rule=Host(`mycompany.org`) && PathPrefix(`/gitserver`)"
      - "traefik.http.middlewares.gitserver-stripprefix.stripprefix.prefixes=/gitserver"
      - "traefik.http.routers.gitserver.middlewares=gitserver-stripprefix"
```

With File Configuration

Canary Releases

```
http:
  services:
    canary:
      weighted:
        services:
        - name: appv1
          weight: 3 # 75%
        - name: appv2
          weight: 1 # 25%
  appv1:
    loadBalancer:
      servers:
      - url: "http://private-ip-server-1/"
  appv2:
    loadBalancer:
      servers:
      - url: "http://private-ip-server-2/"
```

Traefik With ⎈

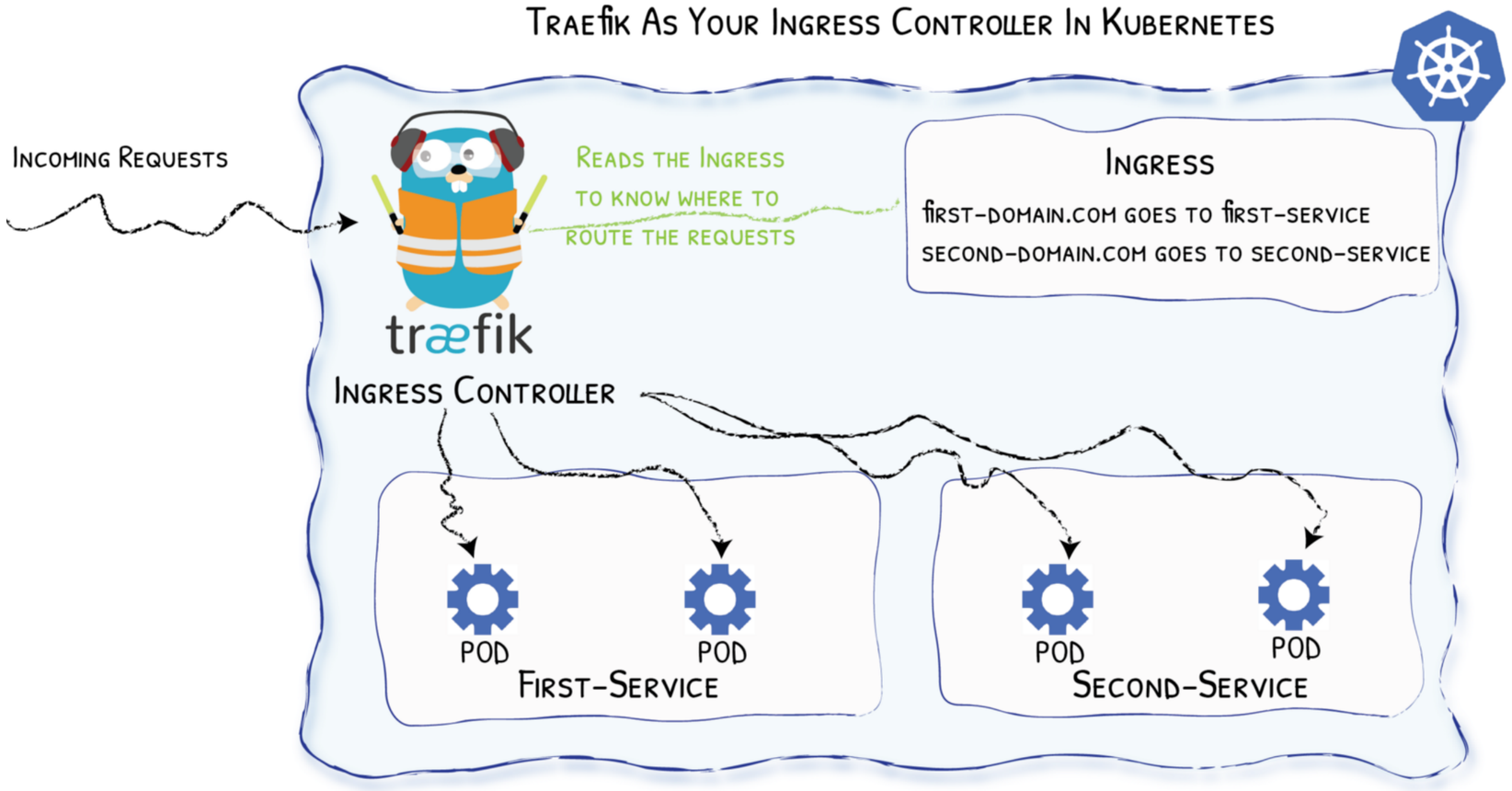


Diagram from https://medium.com/@geraldcroes

Example Code With ☸

```yaml
apiVersion: extensions/v1beta1
kind: Ingress
metadata:
  annotations:
    kubernetes.io/ingress.class: 'traefik'
spec:
  rules:
  - host: localhost
    http:
      paths:
      - path: "/whoami"
        backend:
          serviceName: webapp
          servicePort: 80
```

☸ CRD - Custom Resources Definition

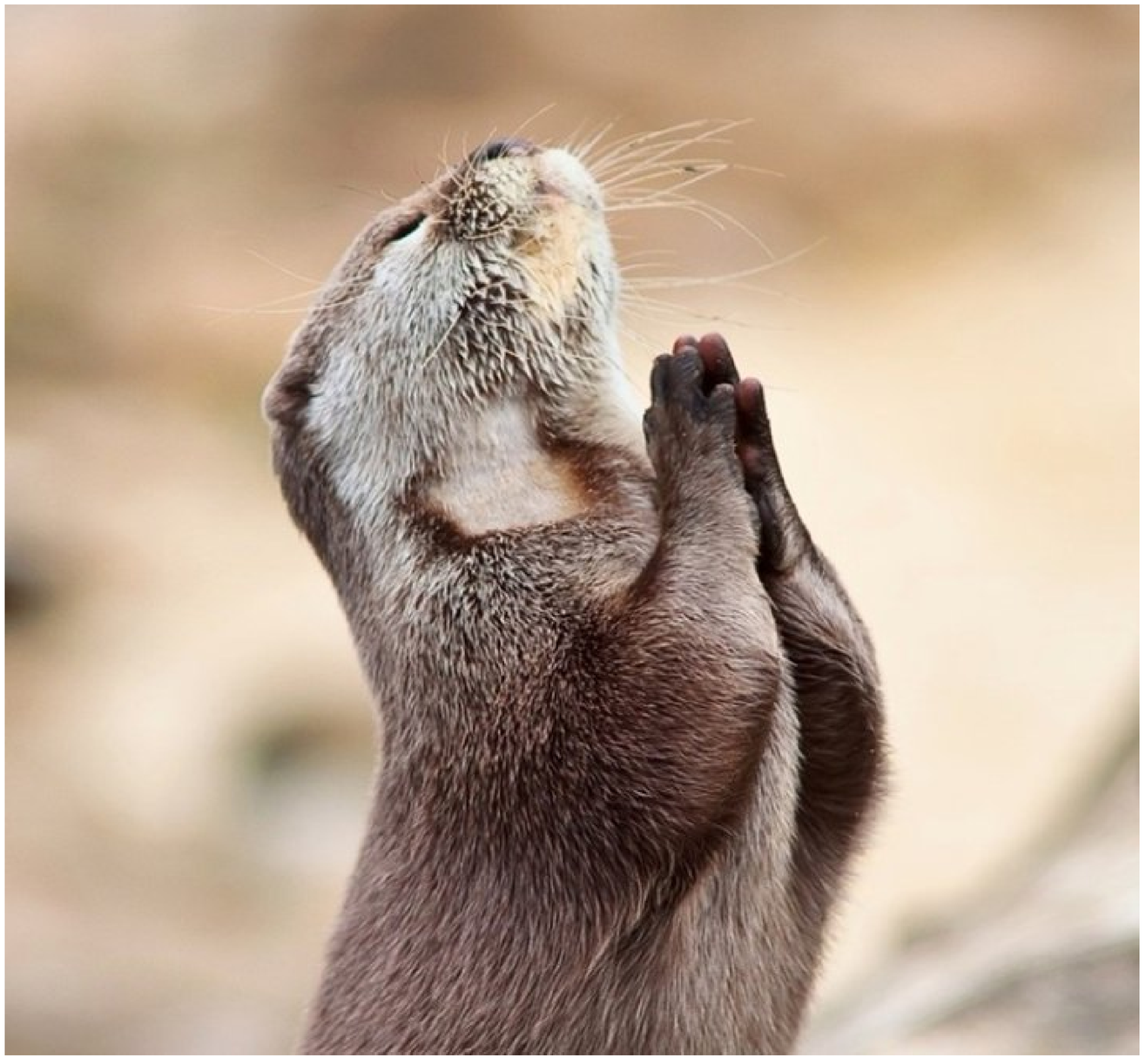
```yaml
# File "webapp.yaml"
apiVersion: traefik.containo.us/v1alpha1
kind: IngressRoute
metadata:
  name: simpleingressroute
spec:
  entryPoints:
    - web
  routes:
  - match: Host(`localhost`) && PathPrefix(`/whoami`)
    kind: Rule
    services:
    - name: webapp
      port: 80
```

```
$ kubectl apply -f webapp.yaml
$ kubectl get ingressroute
```

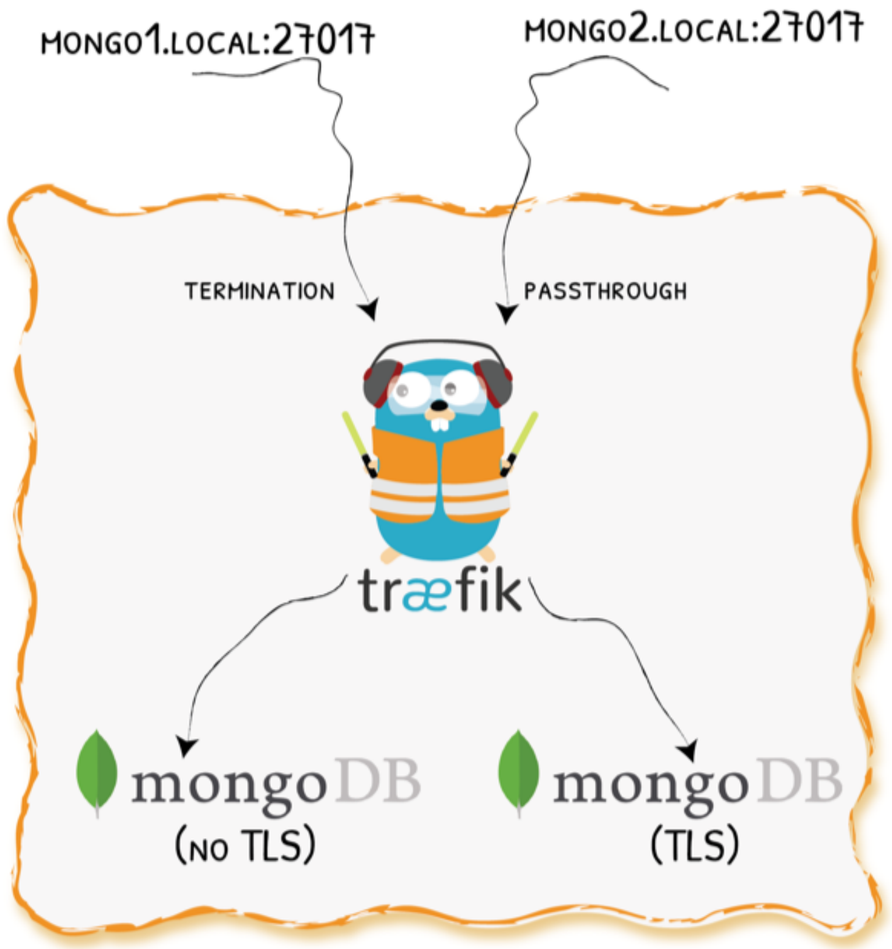
☸ & TCP (With CRD)

```yaml
apiVersion: traefik.containo.us/v1alpha1
kind: IngressRouteTCP
metadata:
  name: ingressroutetcpmongo.crd
spec:
  entryPoints:
    - mongotcp
  routes:
  - match: HostSNI(`mongo-prod`)
    services:
    - name: mongo-prod
      port: 27017
```

Demo

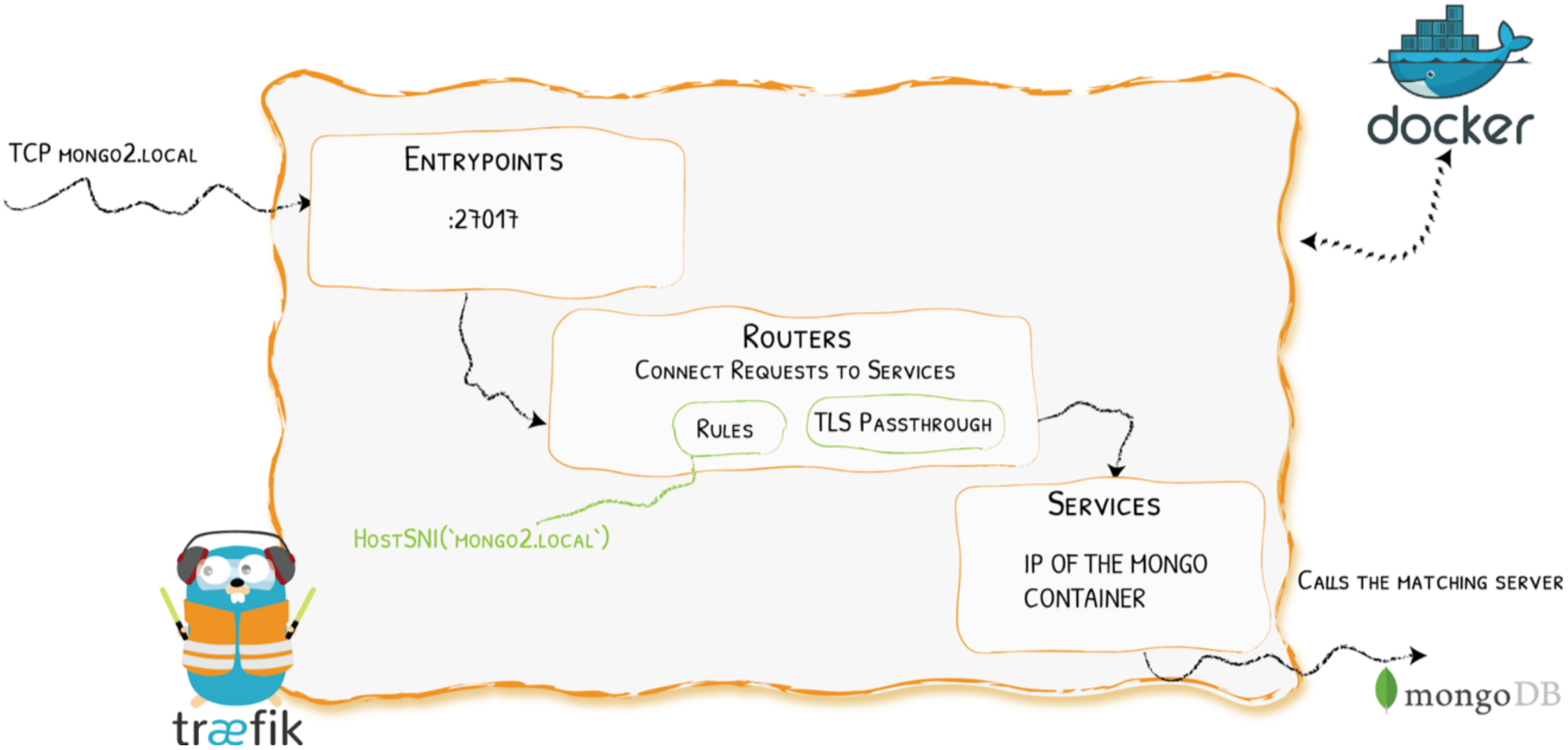


Demo 1 - SNI Routing + TLS Passthrough For TCP

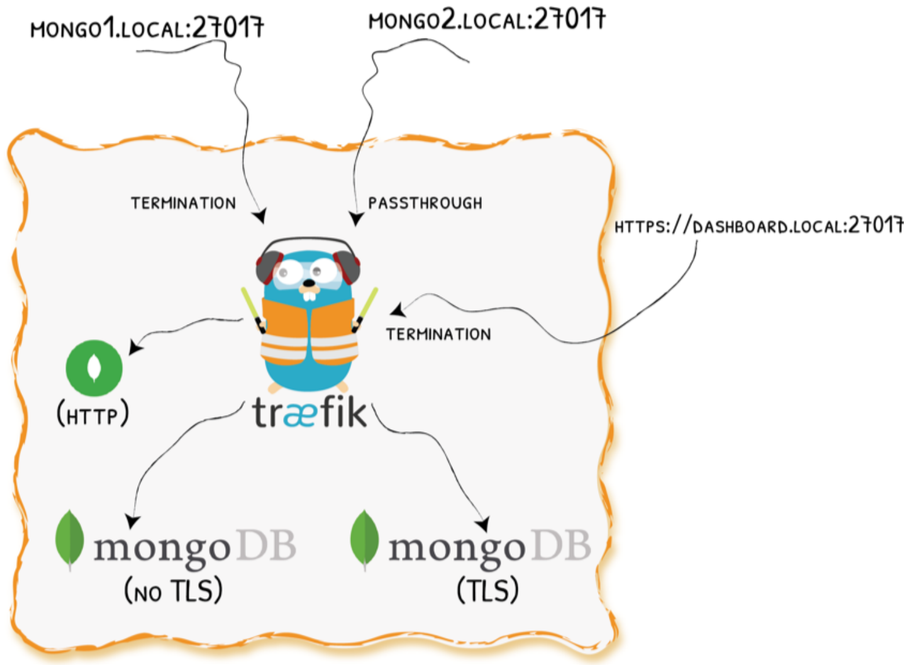


Demo Code on

Demo 1 - Configuration



Demo 2 - Muxing HTTPS And TCP On The Same Port



Demo Code on

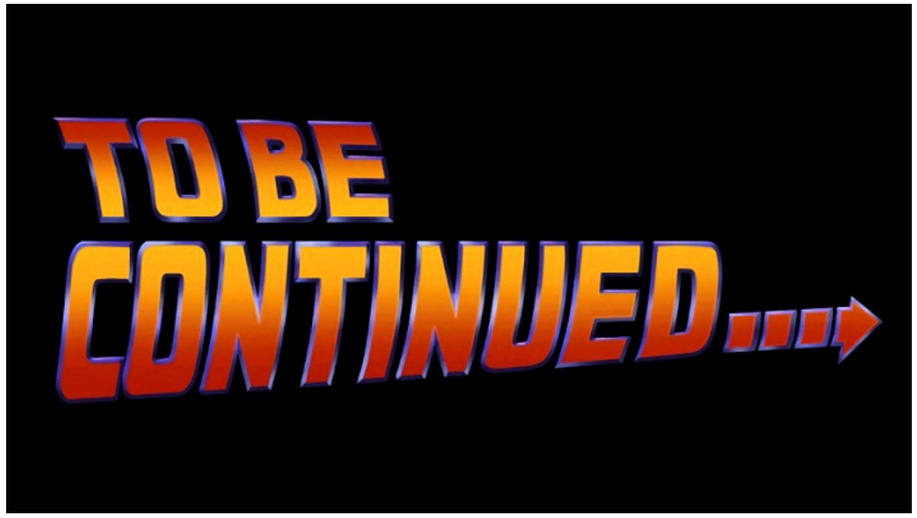
Demo 3 - Canary Release Of A WebApp

More To Come

- New Helm Chart for v2.0
- Advanced Load-Balancing with CRDs: Canary, Mirroring, StickySession, etc.
  - Available today with `File` and `Docker` providers
- Example and Guides
- UDP?

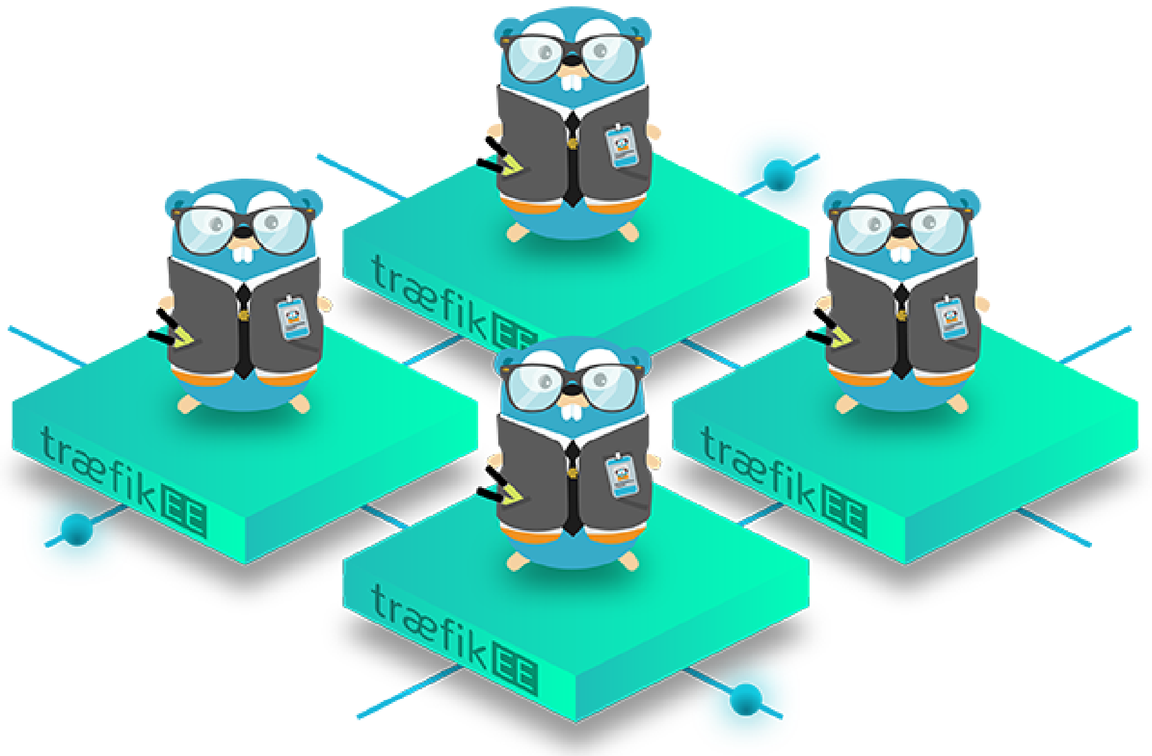
More Info

- Documentation
- Traefik 2.0 Blog Post



We Also Missed Talking About …

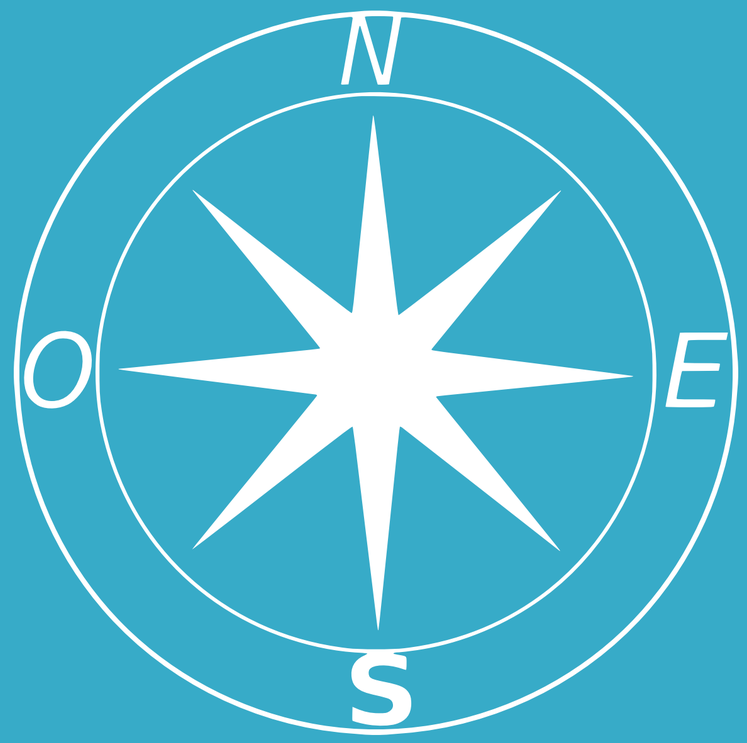
Traefik Comes In Herd



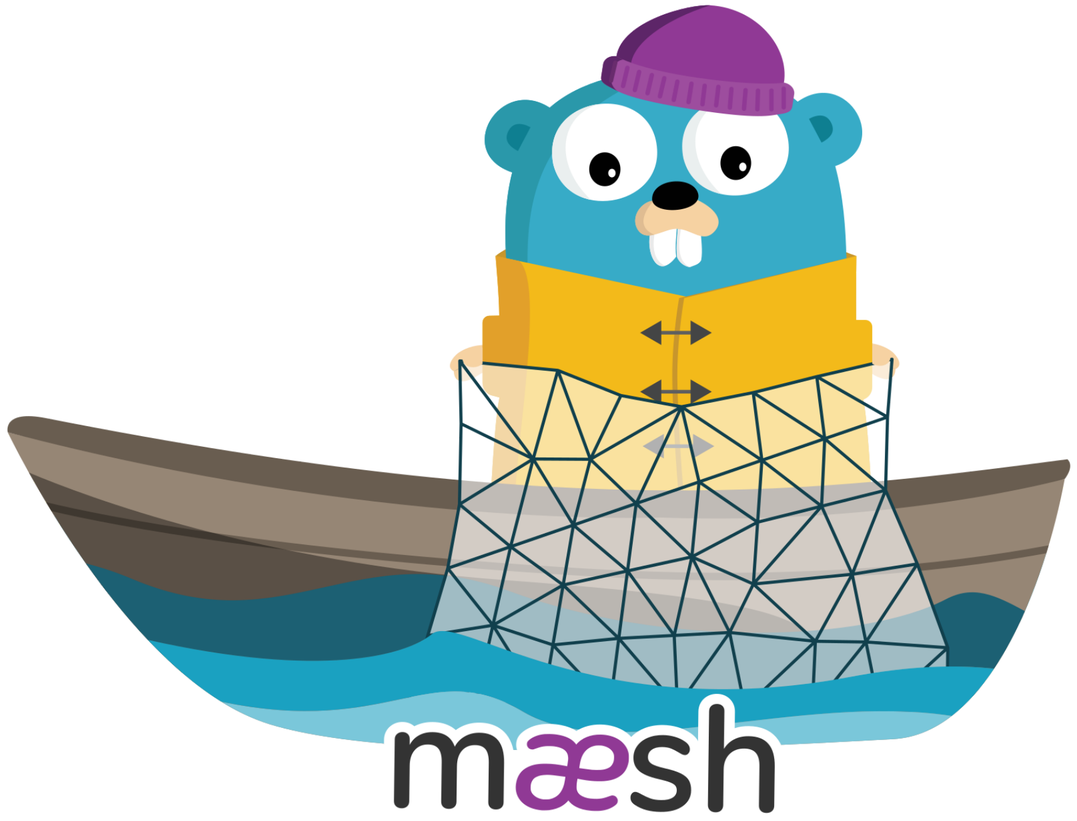
Free Trial

https://containo.us/traefikee

East / West Traefik



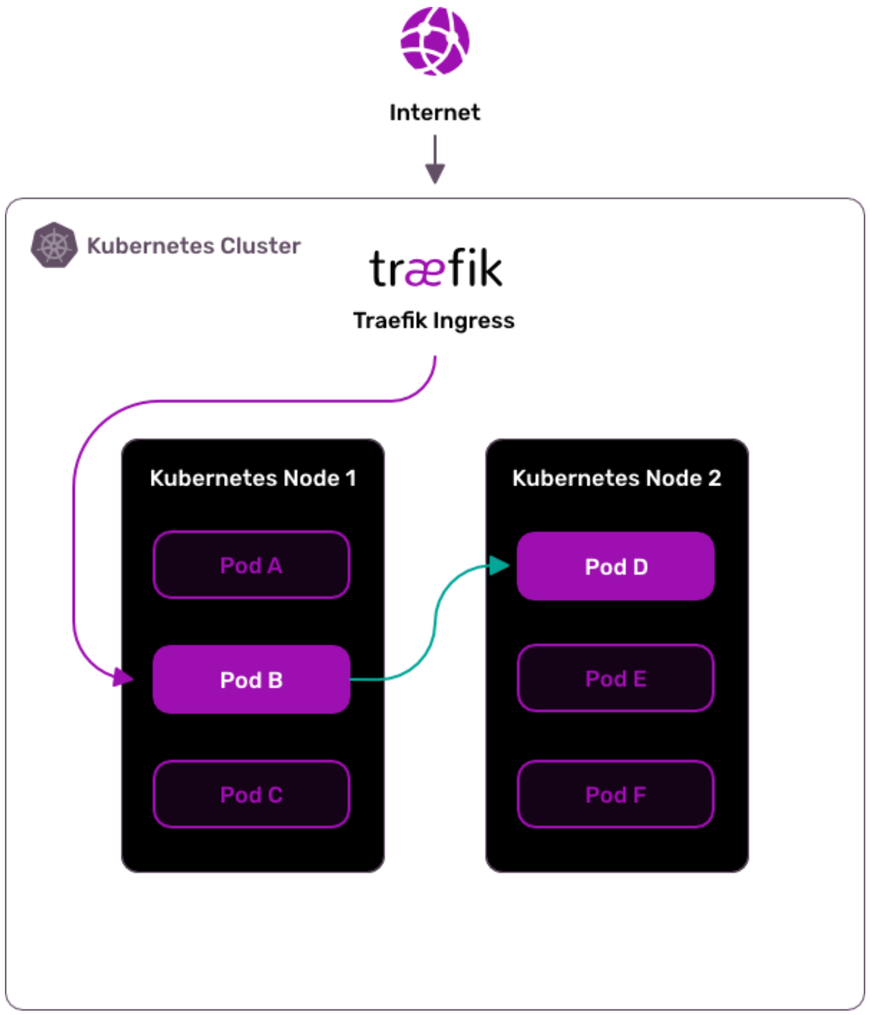
Say Hello To Maesh

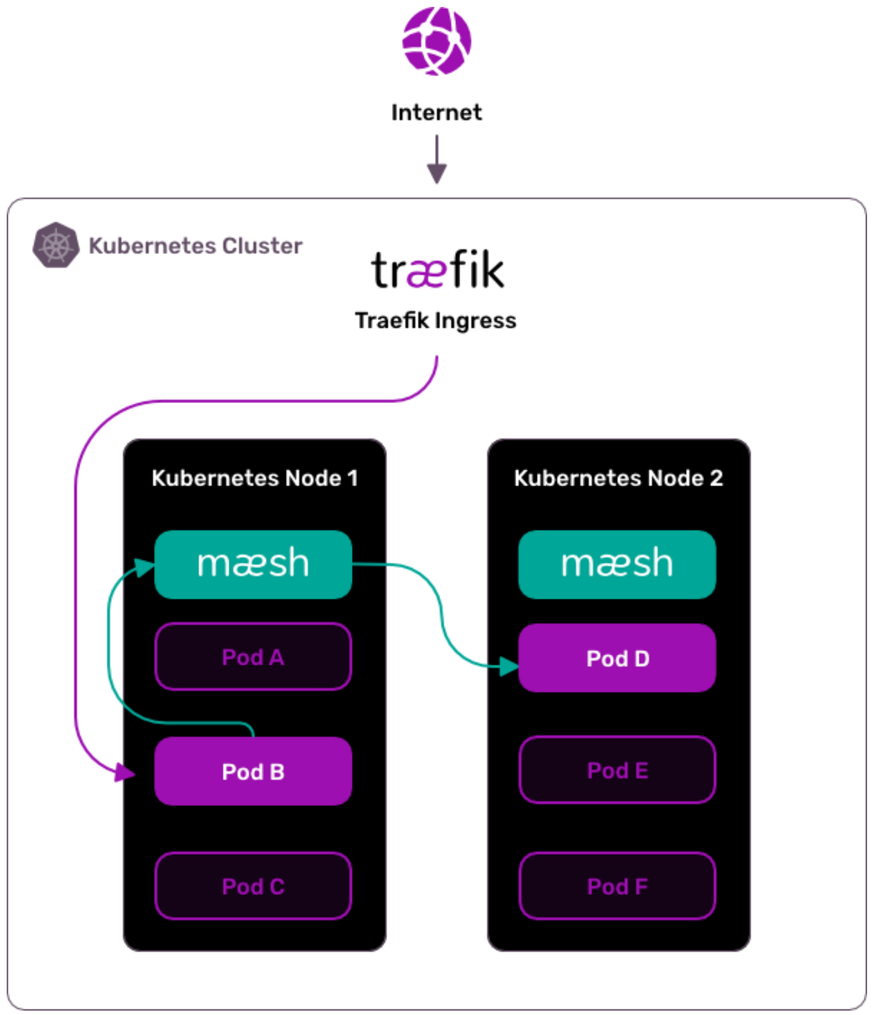


What Is Maesh?

Maesh is a lightweight, easy to configure, and non-invasive service mesh that allows visibility and management of the traffic flows inside any Kubernetes cluster.

Maesh Architecture





More On Maesh

- Built on top of Traefik,
- SMI (Service Mesh Interface specification) compliant,
- Opt-in by default.

Maesh Website

Show Me The Code!

- Install Maesh (Helm Chart):

```
helm repo add maesh https://containous.github.io/maesh/charts
helm repo update
helm install --name=maesh --namespace=maesh maesh/maesh --values=./maesh/values.yaml
```

- Deploy Applications:

```
kubectl apply -f apps/0-namespace.yaml
kubectl apply -f apps/1-svc-accounts.yaml
kubectl apply -f apps/2-apps-client.yaml
kubectl apply -f apps/3-apps-servers.yaml
kubectl apply -f apps/4-ingressroutes.yaml
```

- Deploy SMI Objects to allow traffic in the mesh:

```
kubectl apply -f apps/5-smi-http-route-groups.yaml
kubectl apply -f apps/6-smi-traffic-targets.yaml
```

A Closer Look To SMI Objects

```
apiVersion: specs.smi-spec.io/v1alpha1
kind: HTTPRouteGroup
metadata:
  name: app-routes
  namespace: apps
matches:
- name: all
  pathRegex: "/"
  methods: ["*"]
---
apiVersion: access.smi-spec.io/v1alpha1
kind: TrafficTarget
metadata:
  name: client-apps
  namespace: apps
destination:
  kind: ServiceAccount
  name: apps-server
  namespace: apps
specs:
- kind: HTTPRouteGroup
  name: app-routes
  matches:
  - all
sources:
- kind: ServiceAccount
  name: apps-client
  namespace: apps
```

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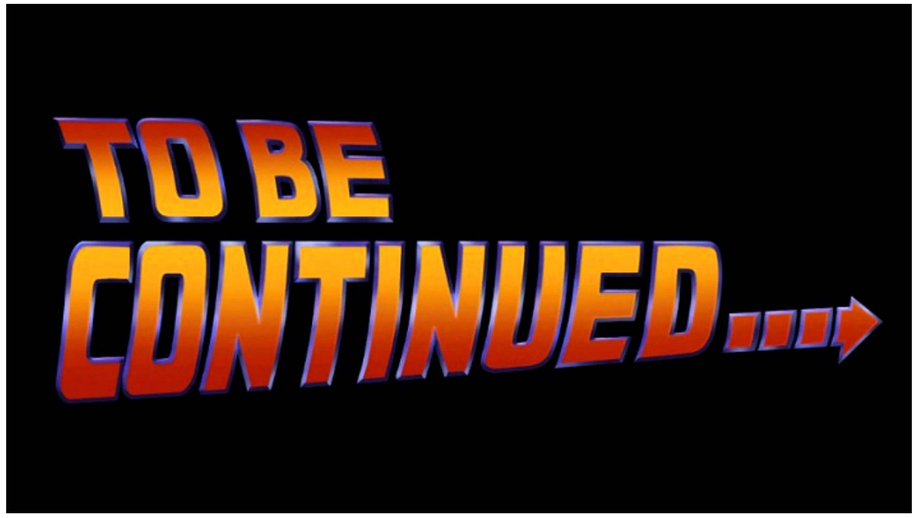

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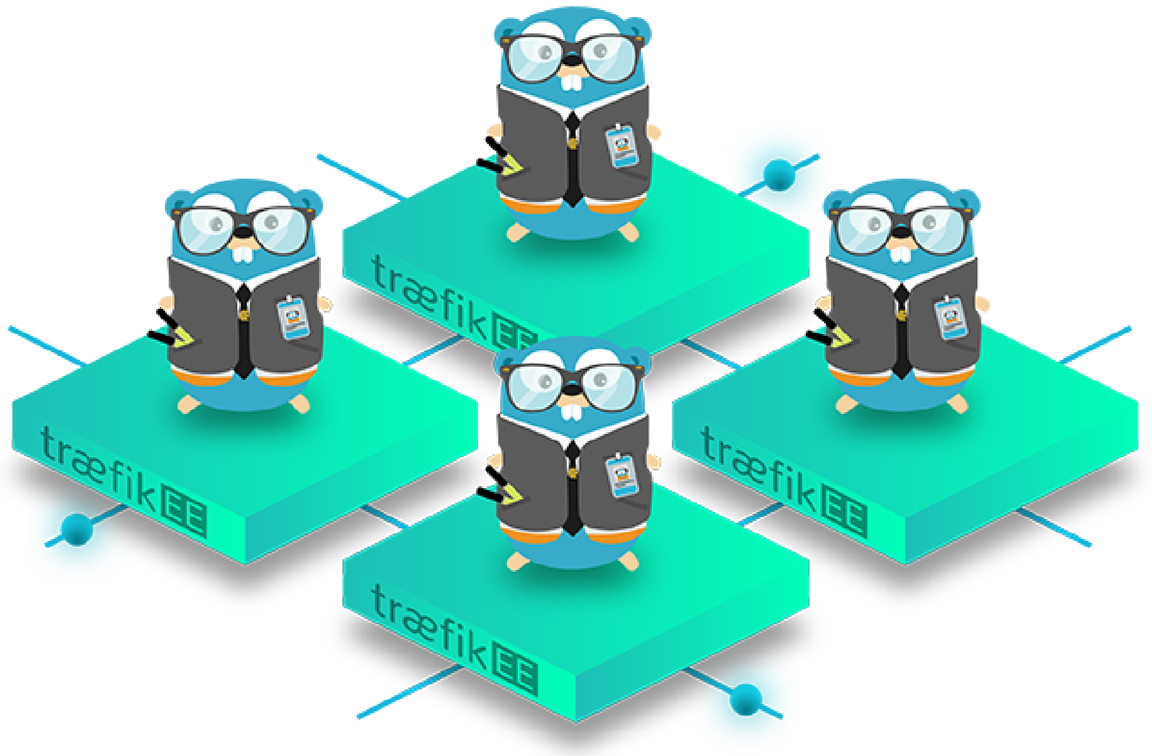

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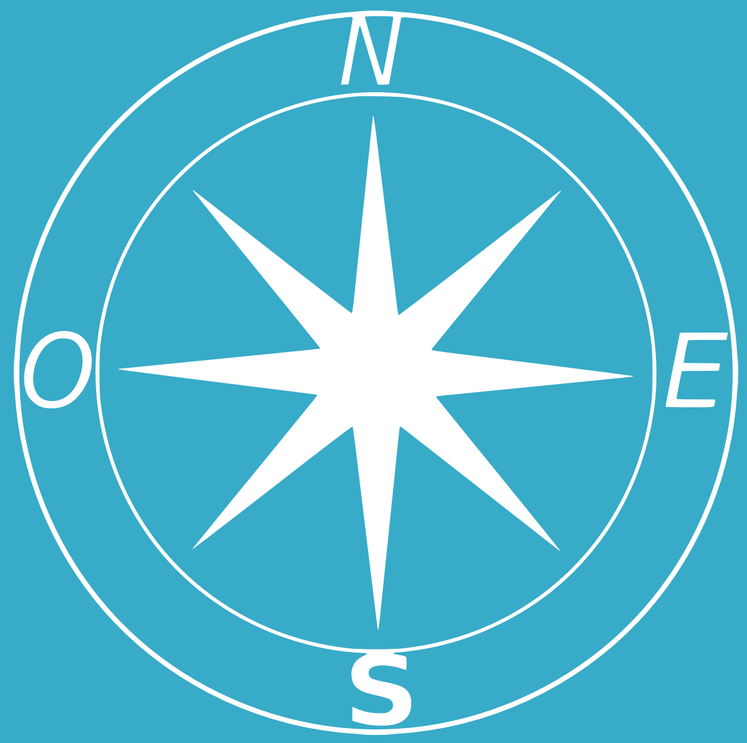

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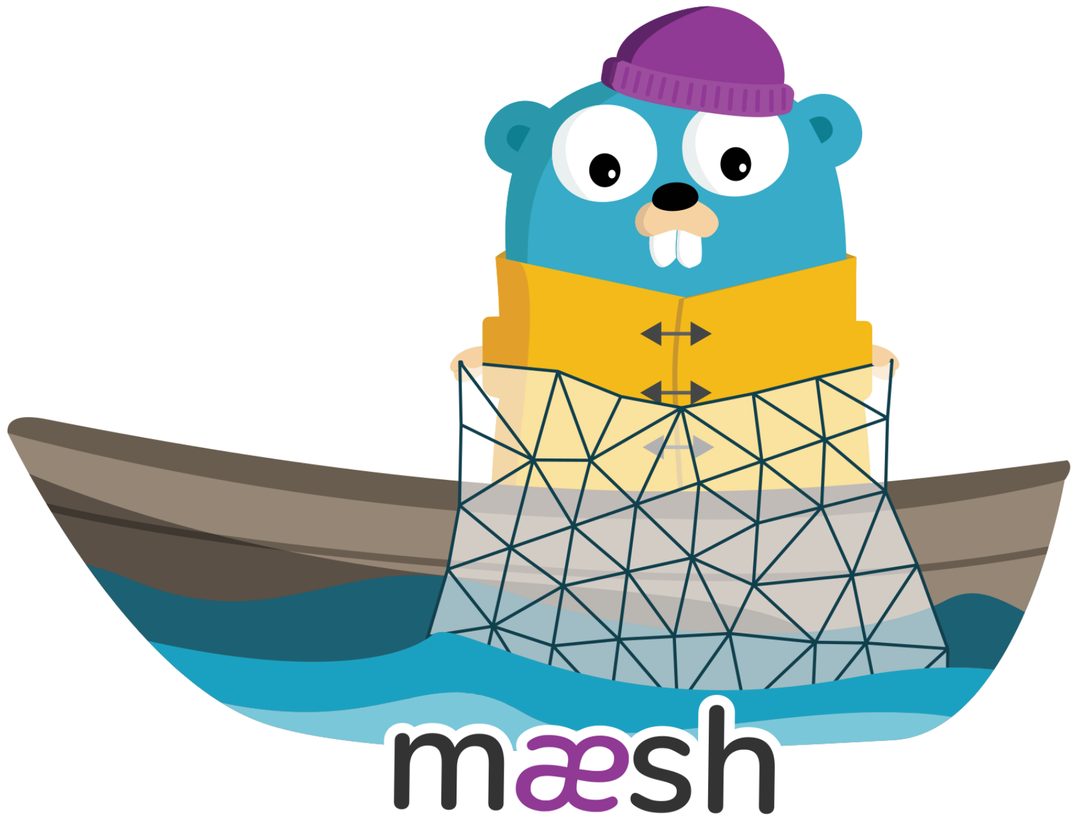

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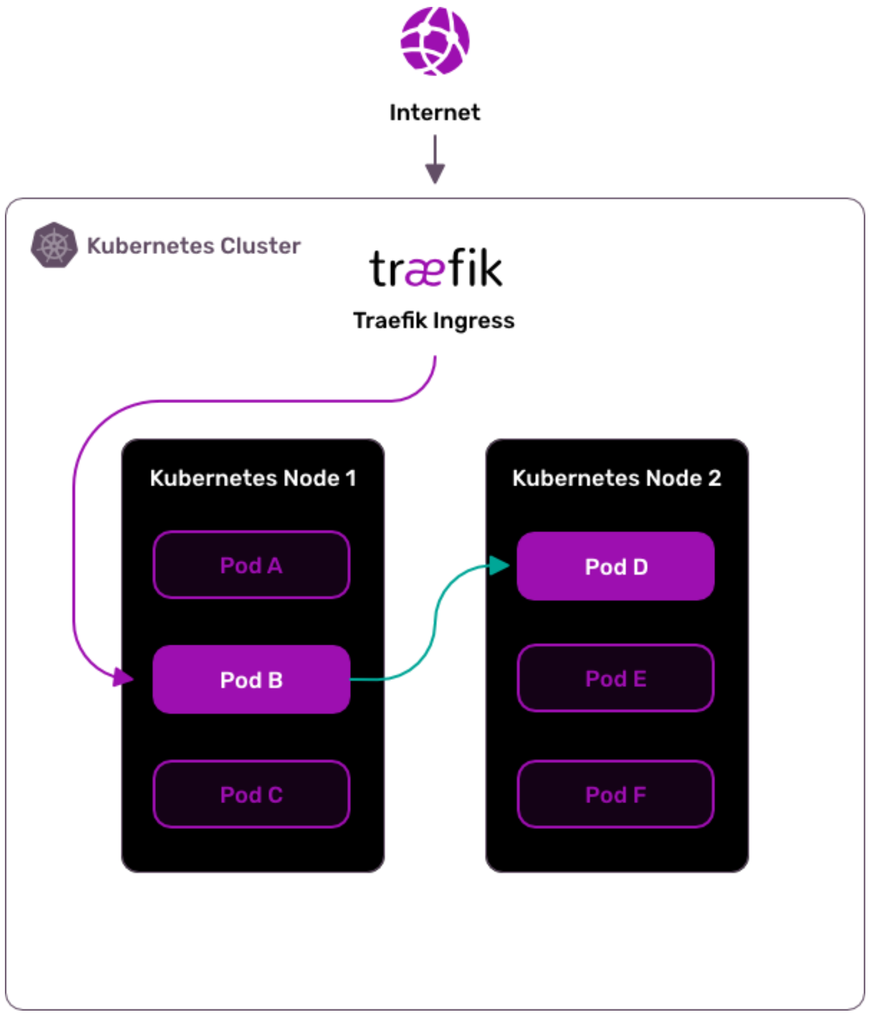

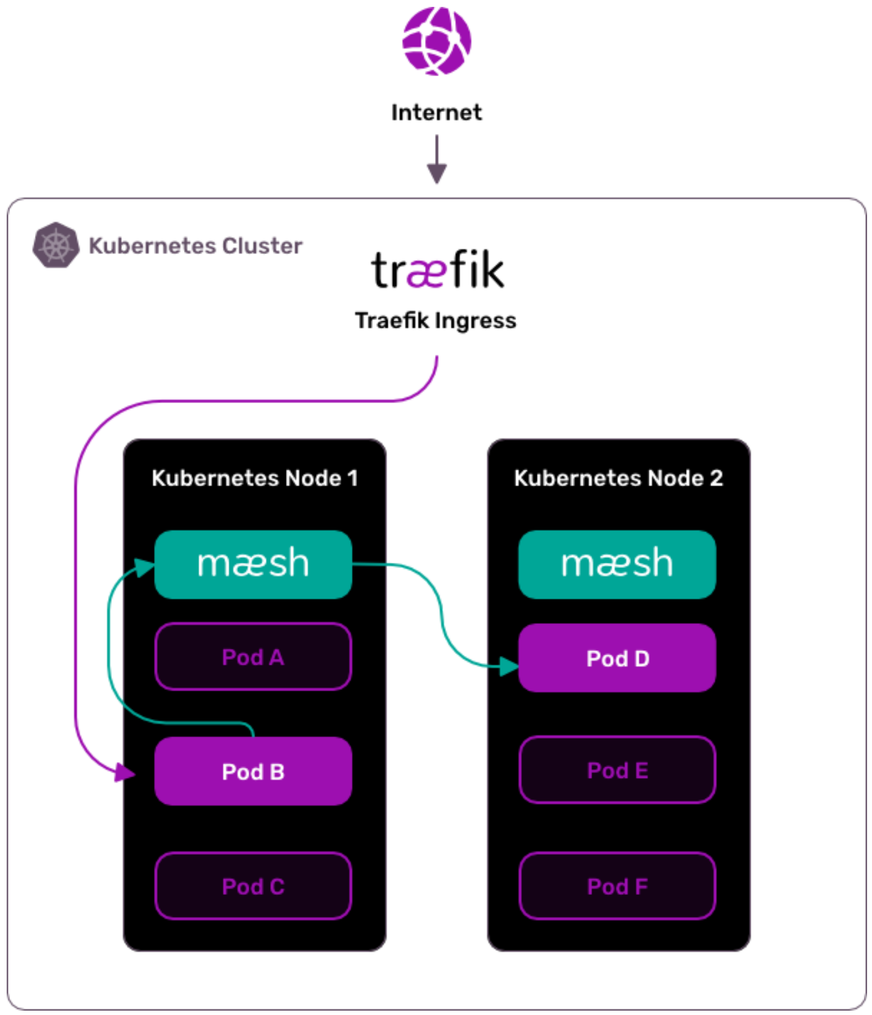

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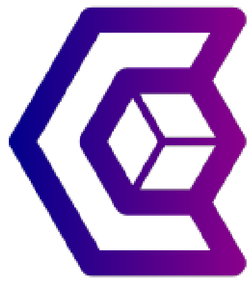
apiVersion: specs.smi-spec.io/v1alpha1
kind: HTTPRouteGroup
metadata:
  name: app-routes
  namespace: apps
matches:
- name: all
  pathRegex: "/"
  methods: ["*"]
---
apiVersion: access.smi-spec.io/v1alpha1
kind: TrafficTarget
metadata:
  name: client-apps
  namespace: apps
destination:
  kind: ServiceAccount
  name: apps-server
  namespace: apps
specs:
- kind: HTTPRouteGroup
  name: app-routes
  matches:
  - all
sources:
- kind: ServiceAccount
  name: apps-client
  namespace: apps
```

That’s All Folks!

We Have Stickers!

We Are Hiring!



```
docker run -it containous/jobs
```

Thank You!

- @jbdoumenjou
- jbdoumenjou

- Slides (HTML): https://containous.github.io/slides/meetup-toulouse-devops-2019
- Slides (PDF): https://containous.github.io/slides/meetup-toulouse-devops-2019/slides.pdf
- Source on : https://github.com/containous/slides/tree/meetup-toulouse-devops-2019