Edge Routing And HTTPS For Everyone

Traefik In Action!

https://containous.github.io/slides/bbl-sg-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 1/2

Michael Matur

- Devops & Developer @ Containous
- Blacksmith on Traefik
- @michaelmatur
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Whoami 2/2

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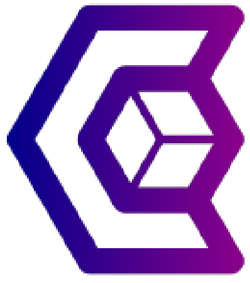
- @martinet_adrien
- adrimartinet

Containous

https://containo.us

- We Believe in Open Source
- We Deliver Traefik
- Commercial Support for Traefik
- 20 people, 90% technical experts



Why Traefik?

Why, Mr Anderson?

Evolution Of Software Design

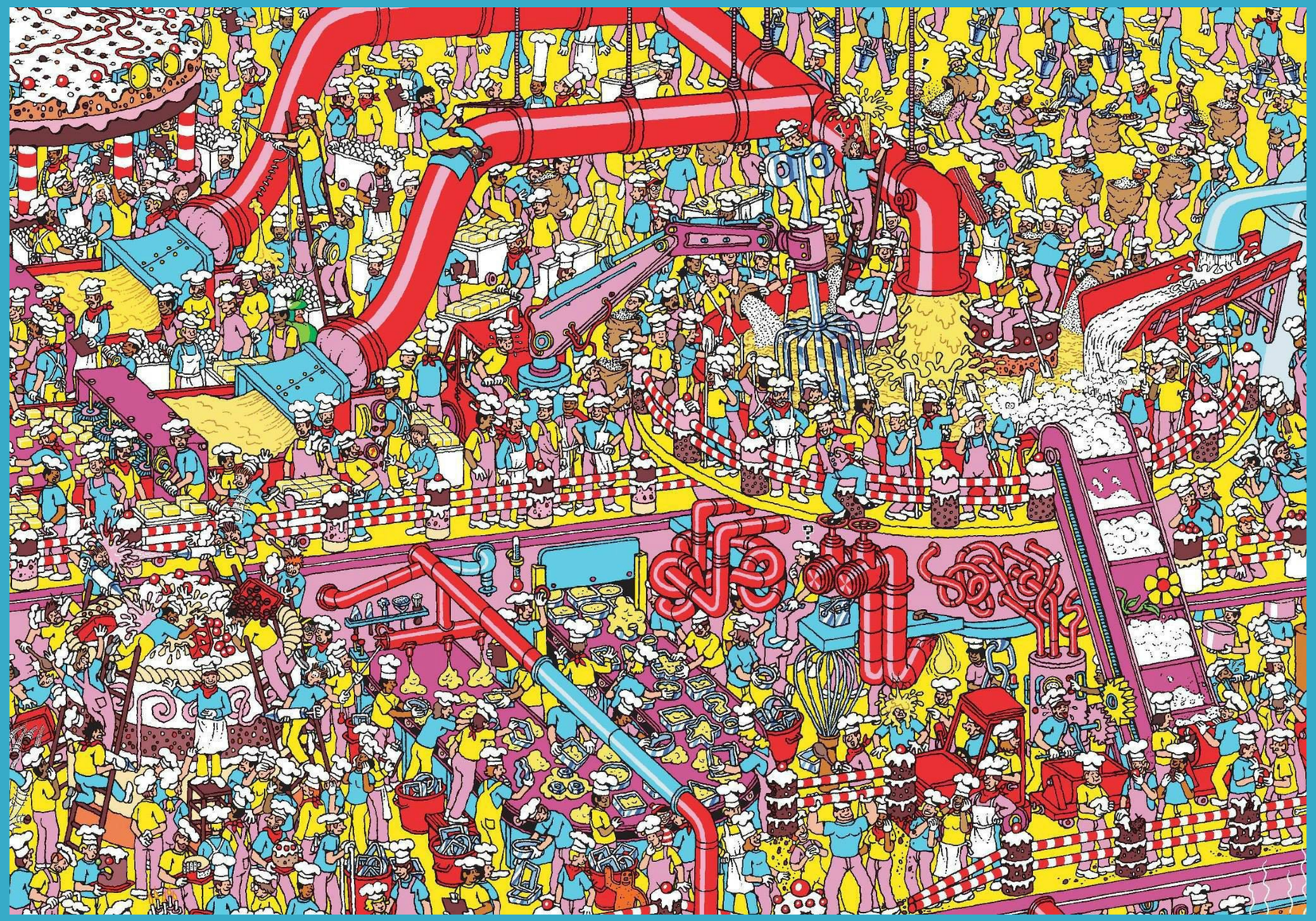
1990s and earlier	2000s	2010s
Coupling		
Pre-SOA (monolithic) Tight coupling	**Traditional SOA** Looser coupling	**Microservices** Decoupled

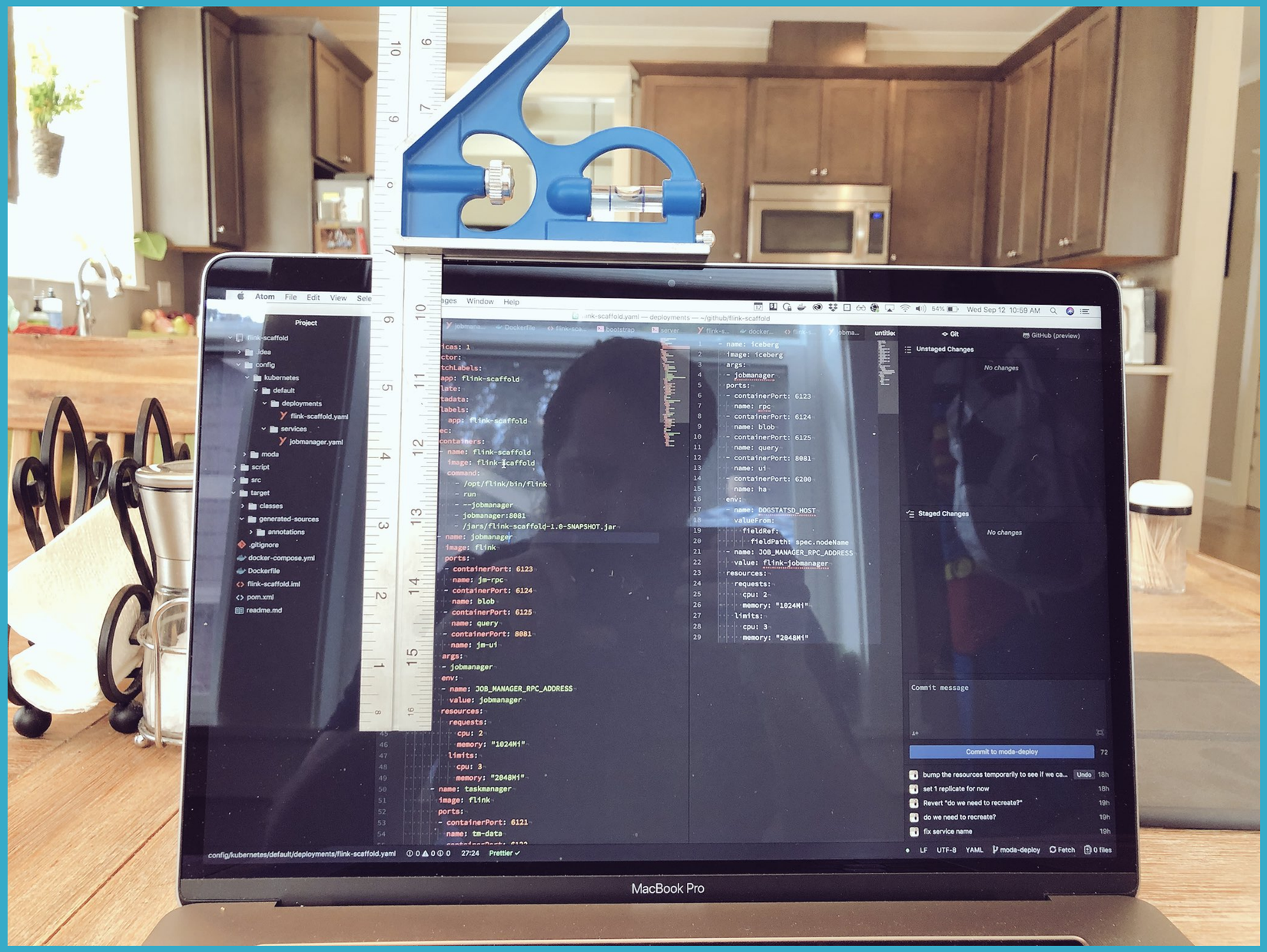
The Premise Of Microservices...

...And What Happens

Tools Of The Trade

Where Is The Service?



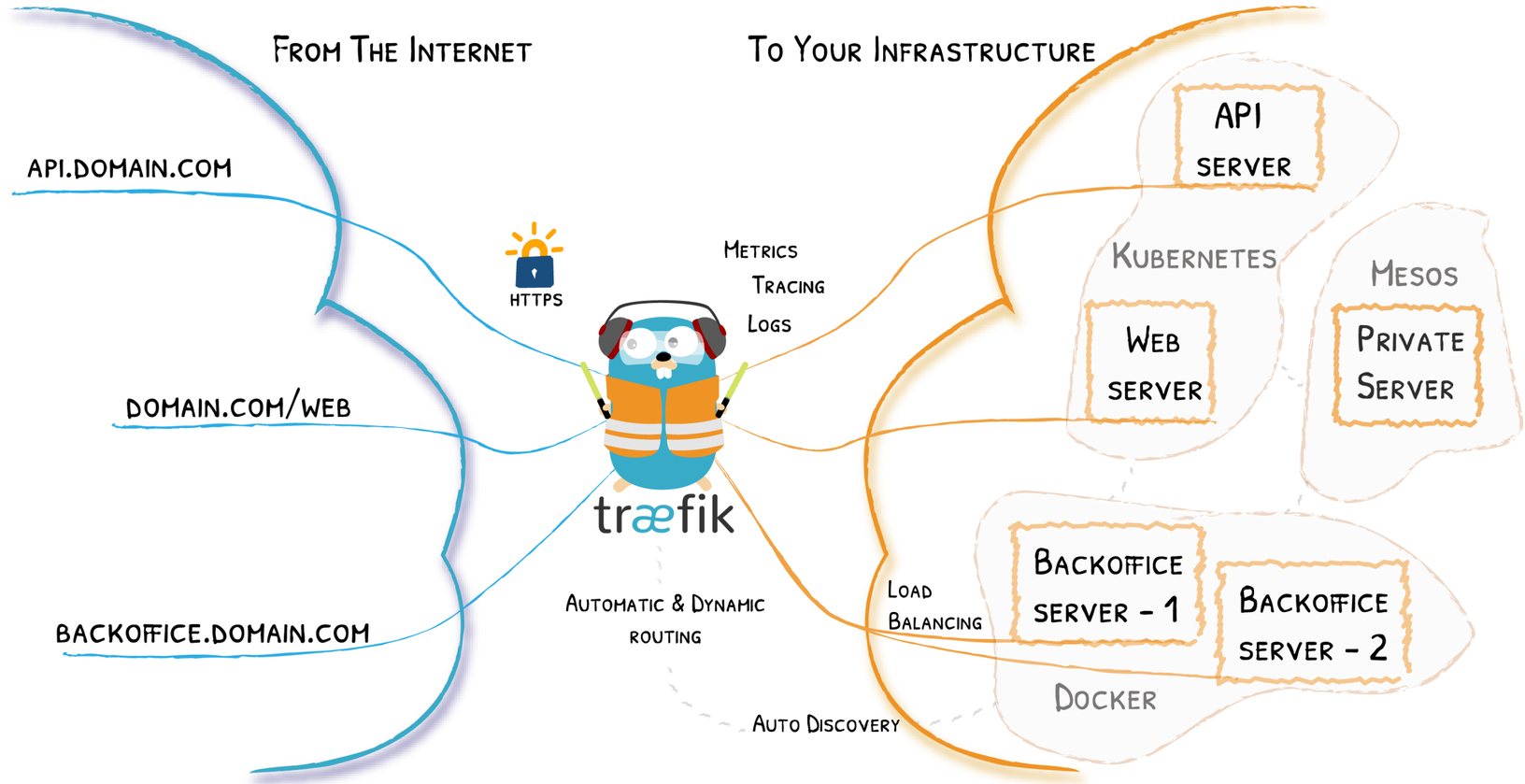


Source: https://twitter.com/Caged/status/1039937162769096704

What If I Told You?

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

Here Comes Traefik!

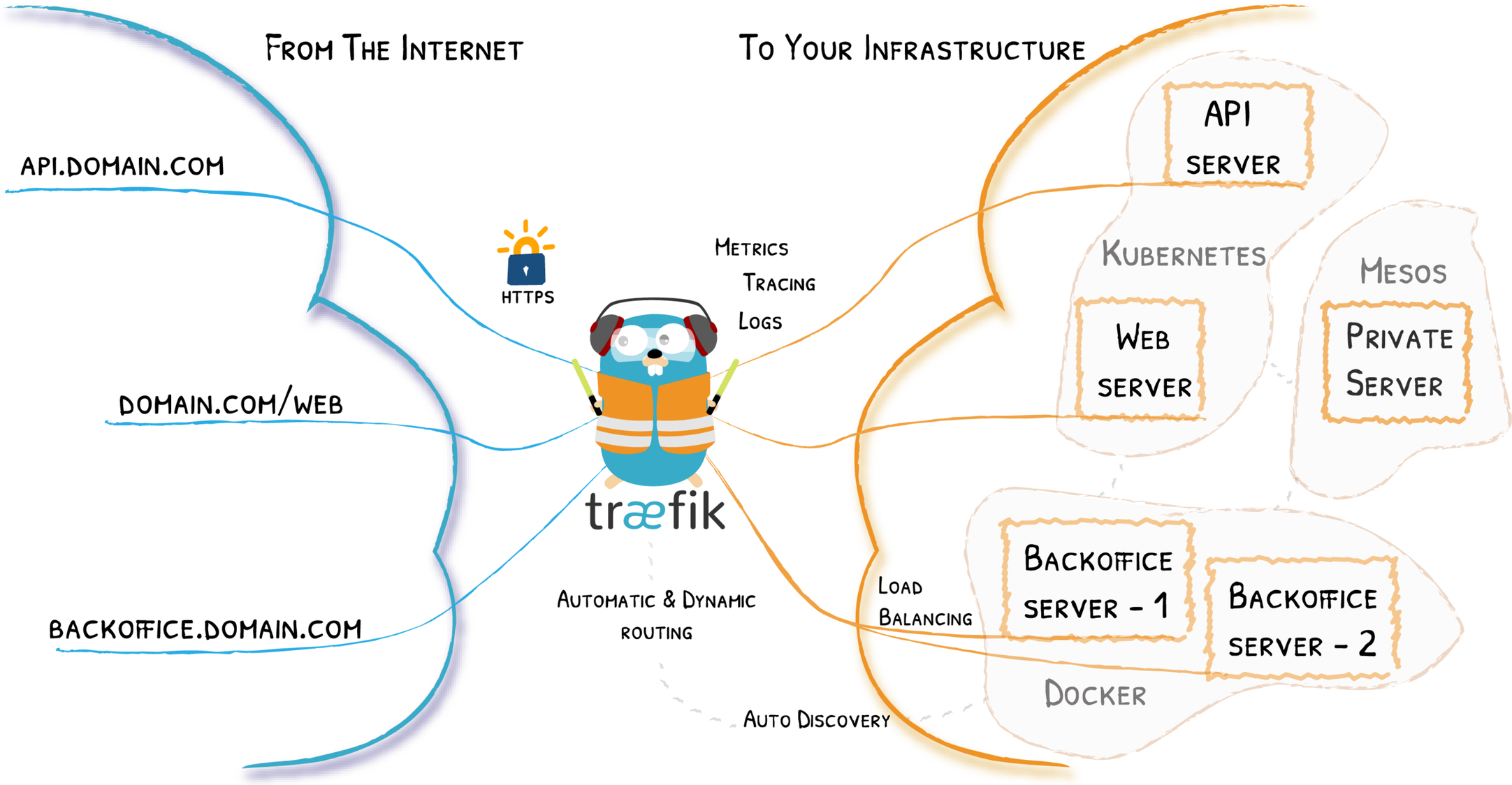


Traefik Project

- https://github.com/containous/traefik
- MIT License
- Written in Go, a popular language
- 22,000+ ☆
- 700M+ ⬇
- 350+ 👷

Traefik Core Concepts

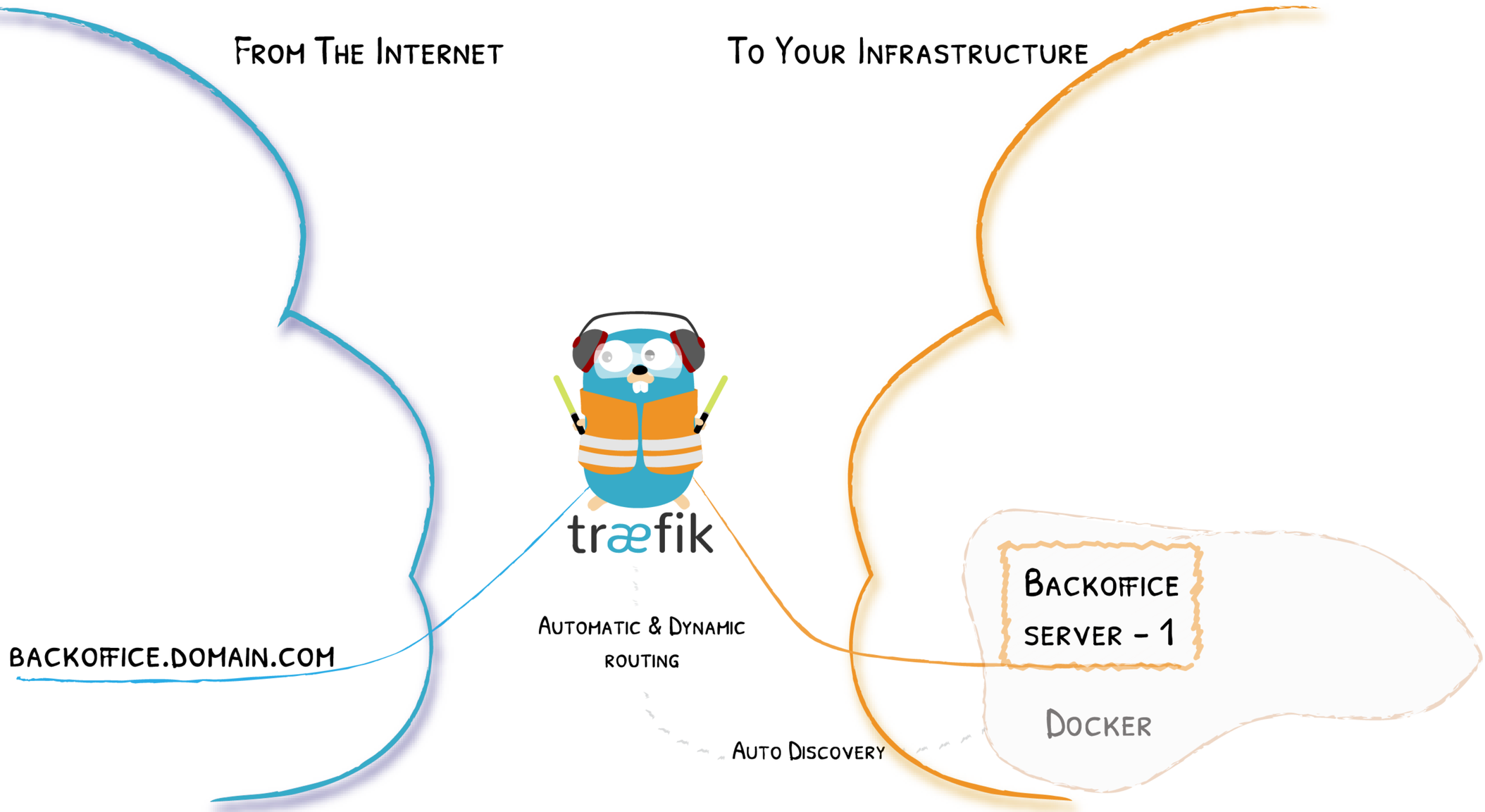
Remember The Diagram?



Let's Simplify

From The Internet

To Your Infrastructure



Providers

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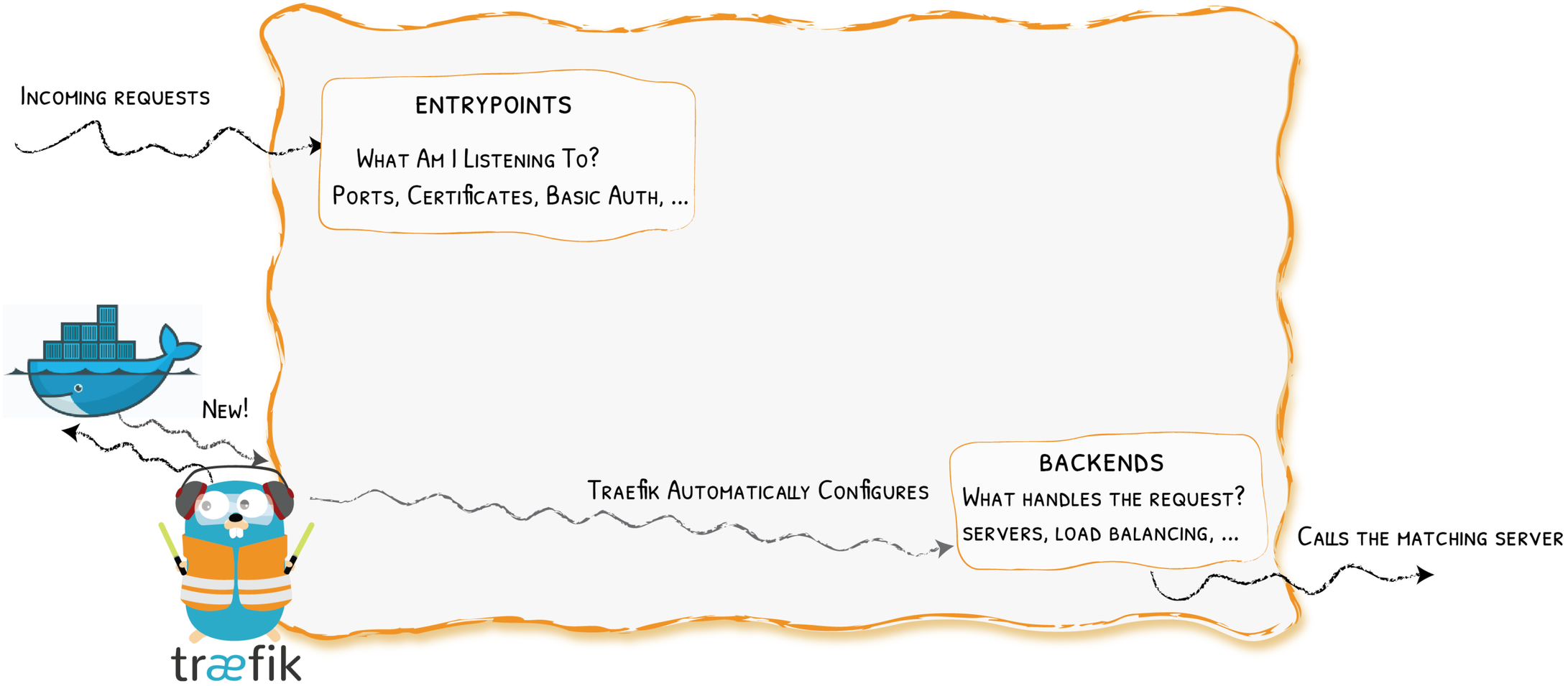
Entrypoints

Backends


Incoming requests
ENTRYPOINTS
What Am I Listening To?
Ports, Certificates, Basic Auth, ...
New!
Traefik Automatically Configures
BACKENDS
What handles the request?
servers, load balancing, ...
Calls the matching server
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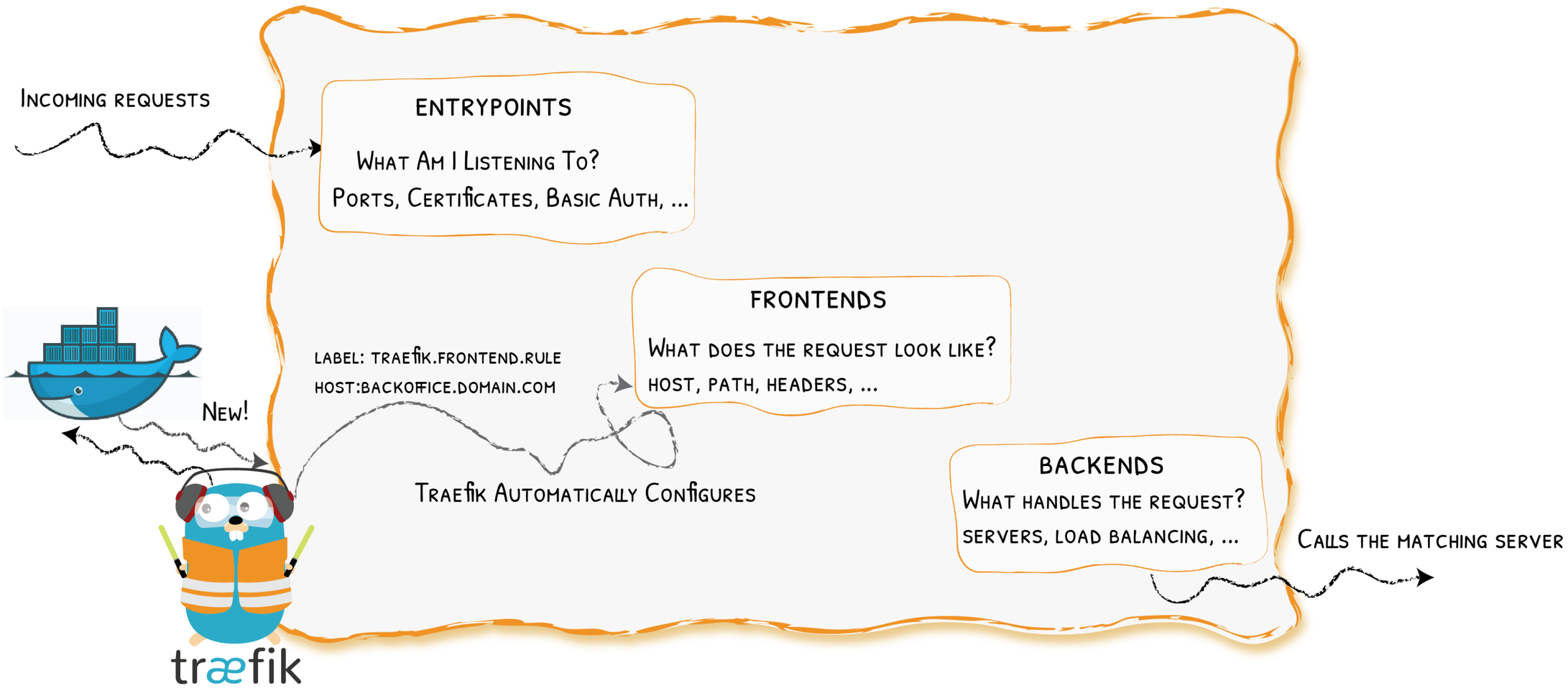
Frontends


Incoming requests
ENTRYPOINTS
What Am I Listening To?
Ports, Certificates, Basic Auth, ...
FRONTENDS
What does the request look like?
Host, Path, Headers, ...
BACKENDS
What handles the request?
servers, load balancing, ...
Calls the matching server
label: traefik.frontend.rule
Host:backoffice.domain.com
Traefik Automatically Configures
New!
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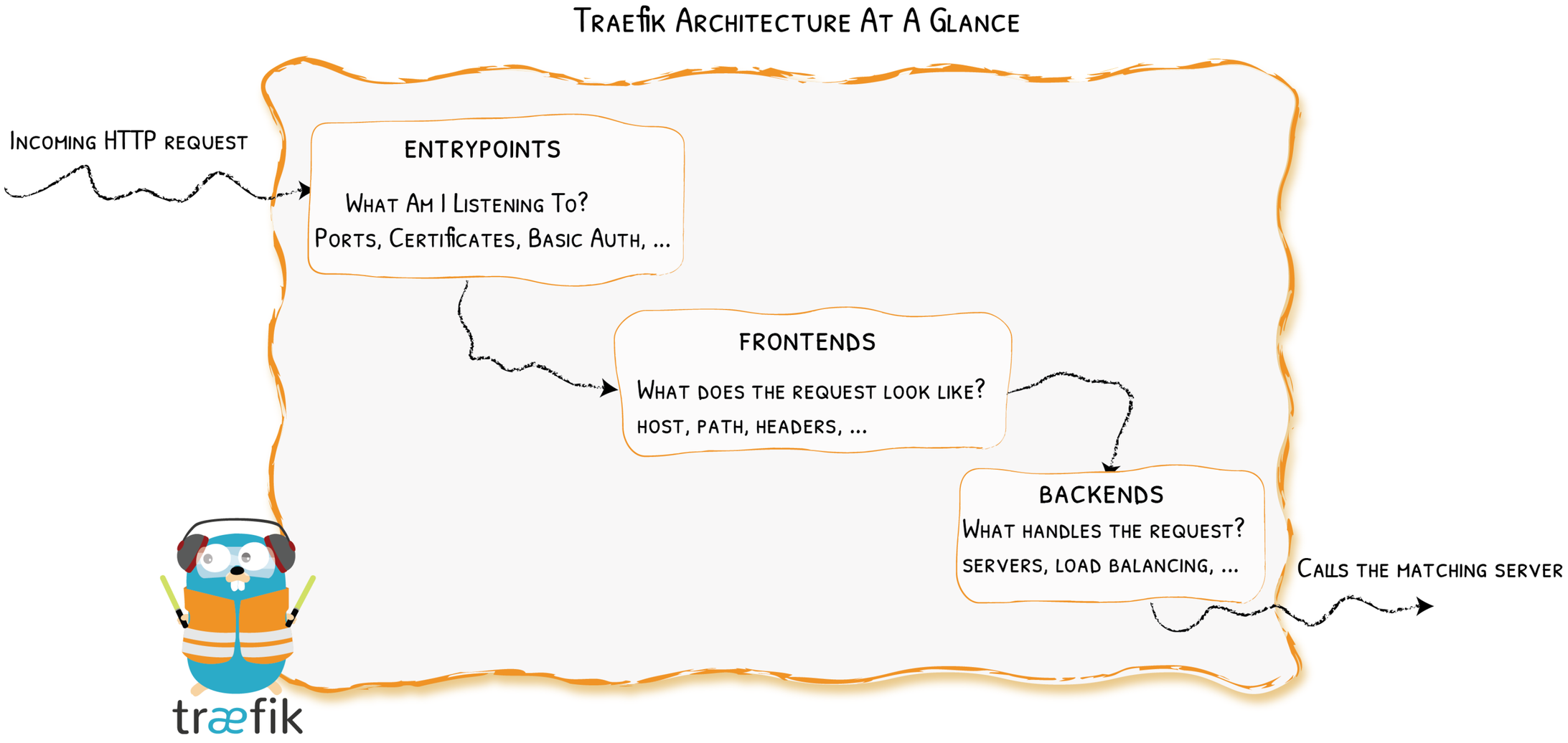
At A Glance


Traefik Architecture At A Glance
Incoming HTTP request
ENTRYPOINTS
What Am I Listening To?
Ports, Certificates, Basic Auth, ...
FRONTENDS
What does the request look like?
Host, Path, Headers, ...
BACKENDS
What handles the request?
Servers, Load Balancing, ...
Calls the matching server
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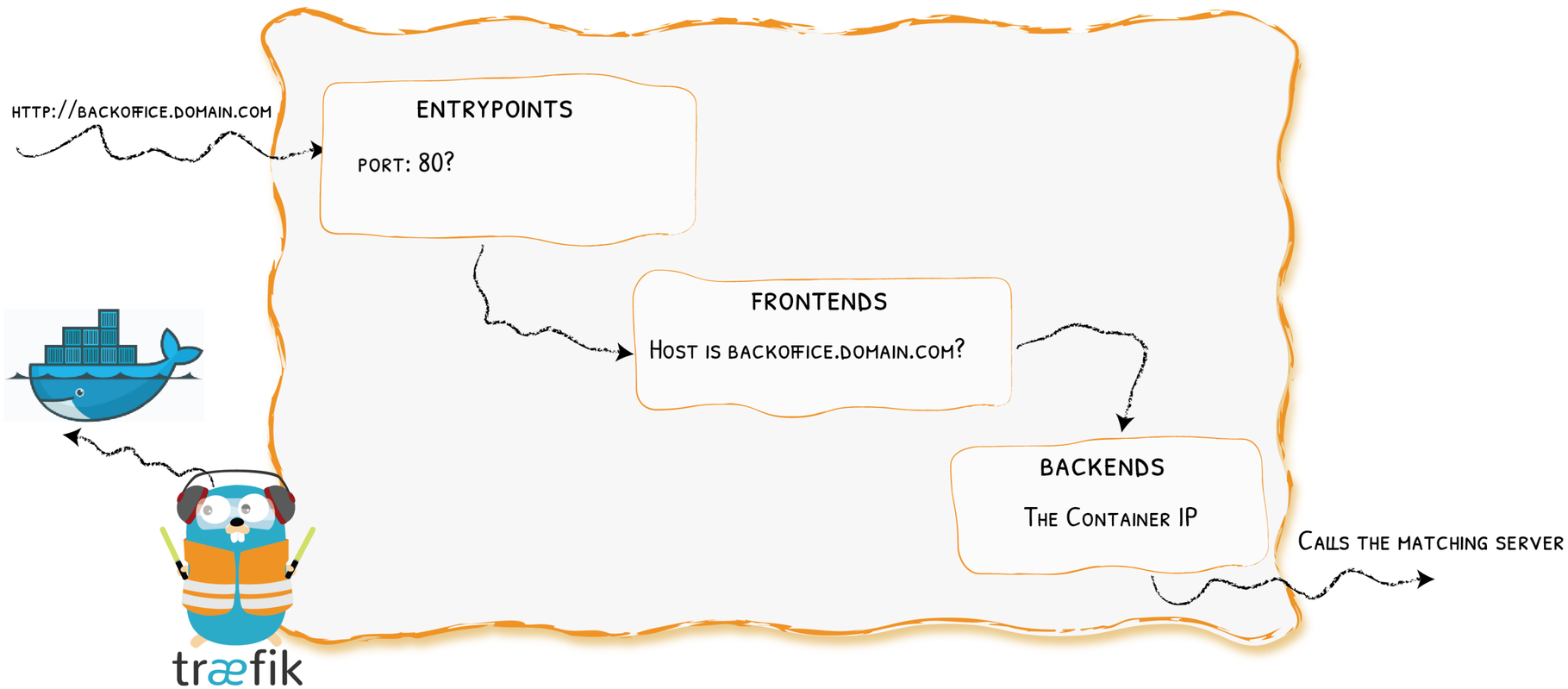
In Practice


HTTP://BACKOFFICE.DOMAIN.COM
ENTRYPOINTS
PORT: 80?
FRONTENDS
HOST IS BACKOFFICE.DOMAIN.COM?
BACKENDS
THE CONTAINER IP
CALLS THE MATCHING SERVER
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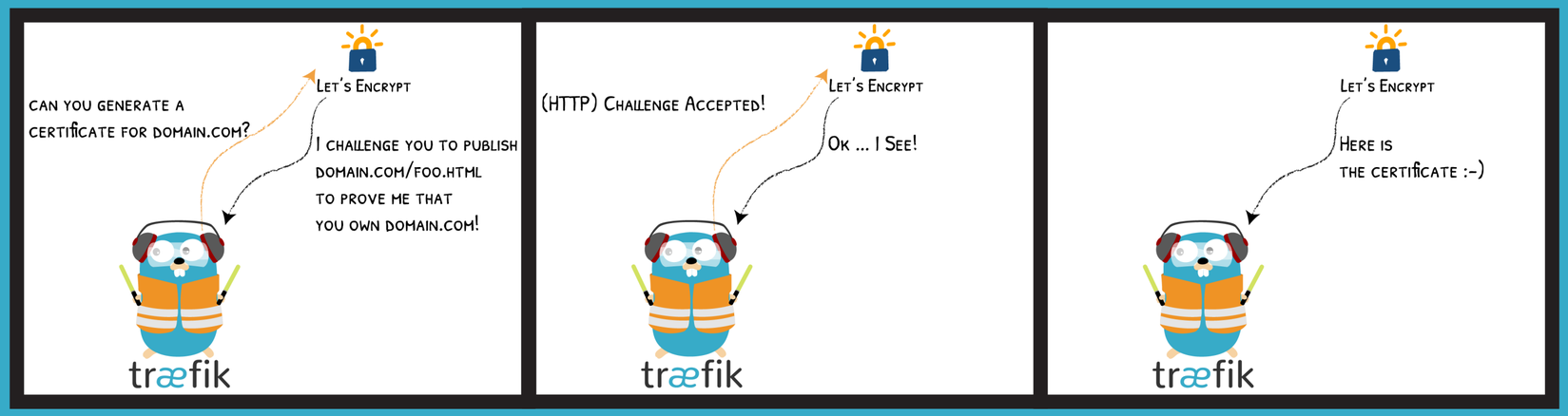
Show Me The Configuration!

Keep It Simple

- With 🐳:

```
entrypoint:
    image: traefik:v1.7
    command:
      - "--docker"
      - "--docker.domain=mycompany.org"
      - "--acme.email=ssl-admin@mycompany.org"
      - "--acme.httpChallenge.entryPoint=http"
      # Or you could use a TOML file with "--configFile=/etc/traefik/traefik.toml
    volumes:
      - /var/run/docker.sock:/var/run/docker.sock
```

HTTPS For Everyone With Let's Encrypt



- TLS, DNS and HTTP challenges supported

With  : Simple Backend

```
# https://www.mycompany.org -> http://webserver:80/
webserver:
    image: nginx:alpine
    labels:
      - "traefik.frontend.rule=Host:www.mycompany.org"
```

With : Context

```
# https://mycompany.org/jenkins -> http://jenkins:8080/jenkins
jenkins:
    image: jenkins/jenkins:lts
    labels:
      - "traefik.frontend.rule=PathPrefix:/jenkins"
      - "traefik.port=8080" # Because 50000 is also exposed
    environment:
      - JENKINS_OPTS=--prefix=/jenkins
```

With : Rewrites

```
# https://mycompany.org/gitserver -> http://gitserver:3000/
gitserver:
    image: gitea/gitea:1.5
    labels:
      - "traefik.frontend.rule=PathPrefixStrip:/gitserver"
      - "traefik.port=3000" # Because 22 is also exposed
```

With : Websockets

```
# https://mycompany.org/webterminal -> http://webterminal:7681/
webterminal:
    image: tsl0922/ttyd
    labels:
      - "traefik.frontend.rule=PathPrefixStrip:/webterminal"
    expose:
      - "7681"
```

Traefik With ⎈

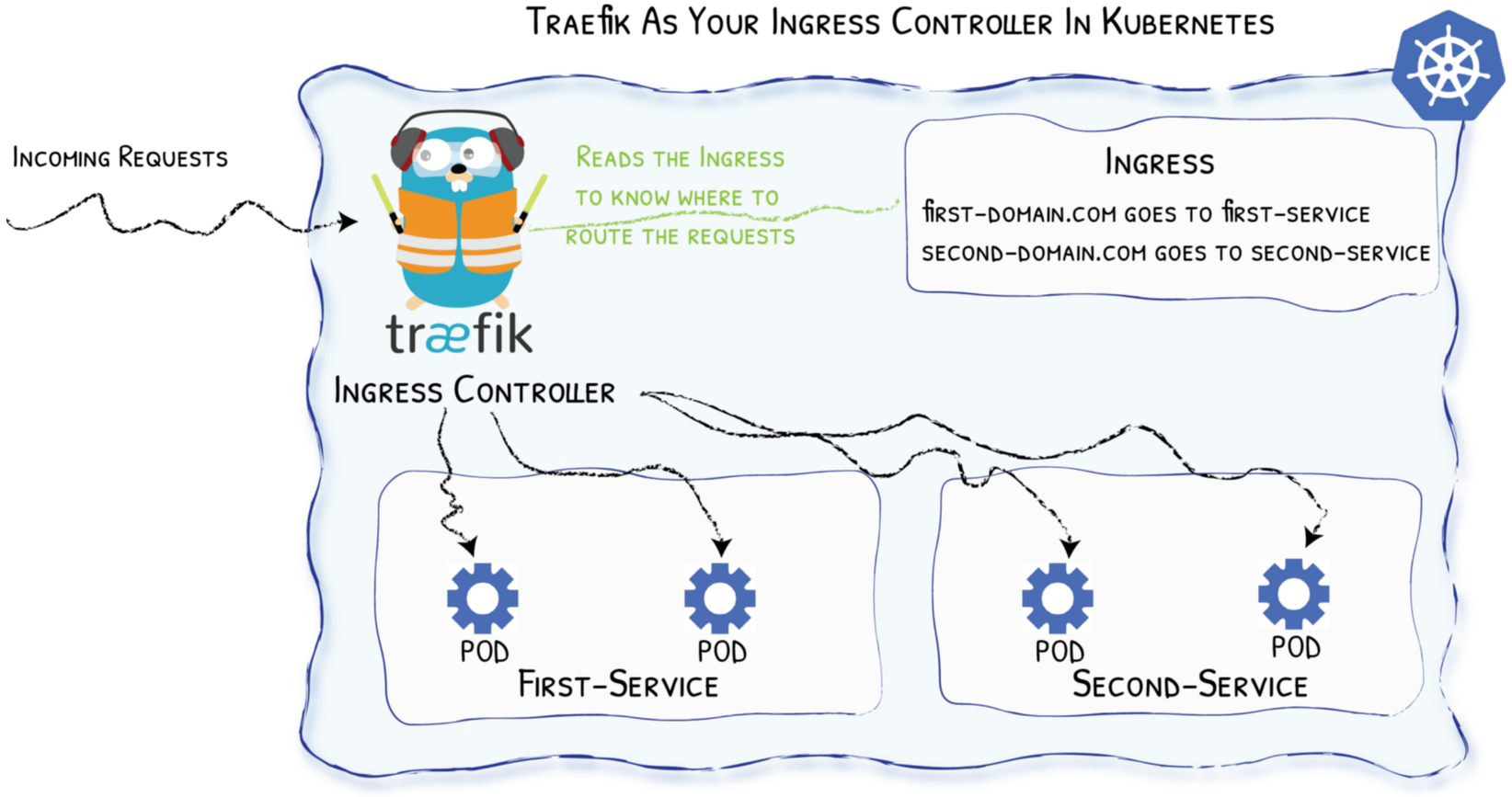


Diagram from https://medium.com/@geraldcroes

Did You Say YAML?

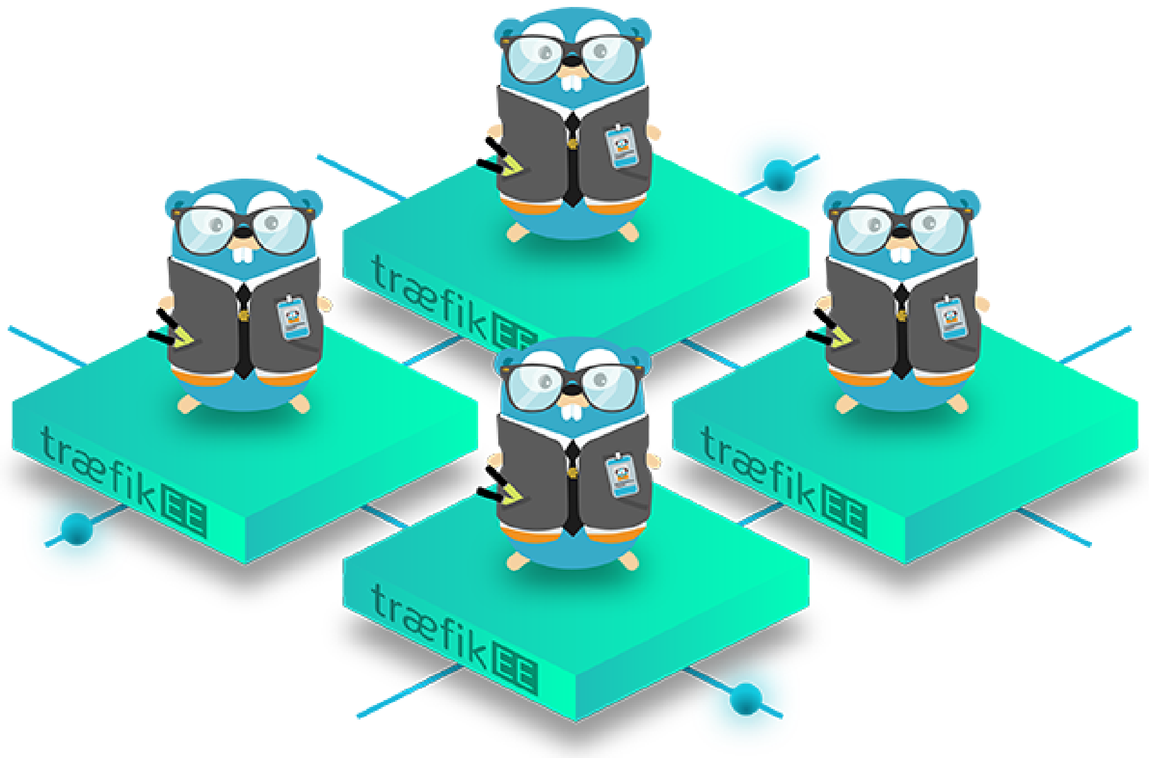
```yaml
apiVersion: extensions/v1beta1
kind: Ingress
metadata:
  annotations:
    # kubernetes.io/ingress.class: 'nginx'
    kubernetes.io/ingress.class: 'traefik'
spec:
  rules:
  - host: mycompany.org
    http:
      paths:
      - path: "/whoami"
        backend:
          serviceName: whoami
   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

We Missed Talking About...

The Herd

You came to the wrong neighbour

Traefik Comes In Herd



HIGH AVAILABILITY

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SECURITY

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SCALABILITY

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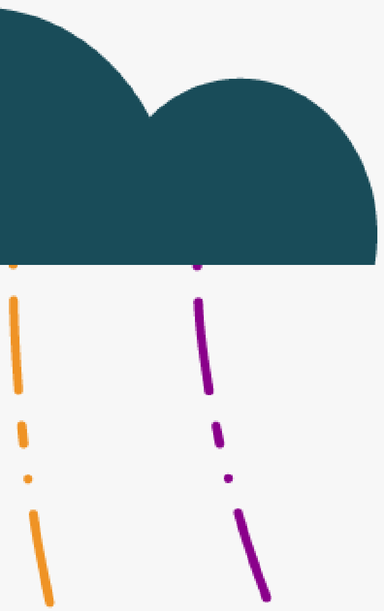
NTERNET

TO YOUR INFRA



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ORCHESTR

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As Simple As Traefik

- Install it:

```
# Cluster Installation
traefikeectl install \
    --licensekey="SuperSecretLicence" \
    --dashboard \
    --kubernetes # Or --swarm
```

- Configure it:

```
# Routing Configuration, same as Traefik's
traefikeectl deploy \
    --acme.email=ssl-admin@mycompany.org
    --acme.tlsChallenge
    ...
```

Free Trial

https://containo.us/traefikee

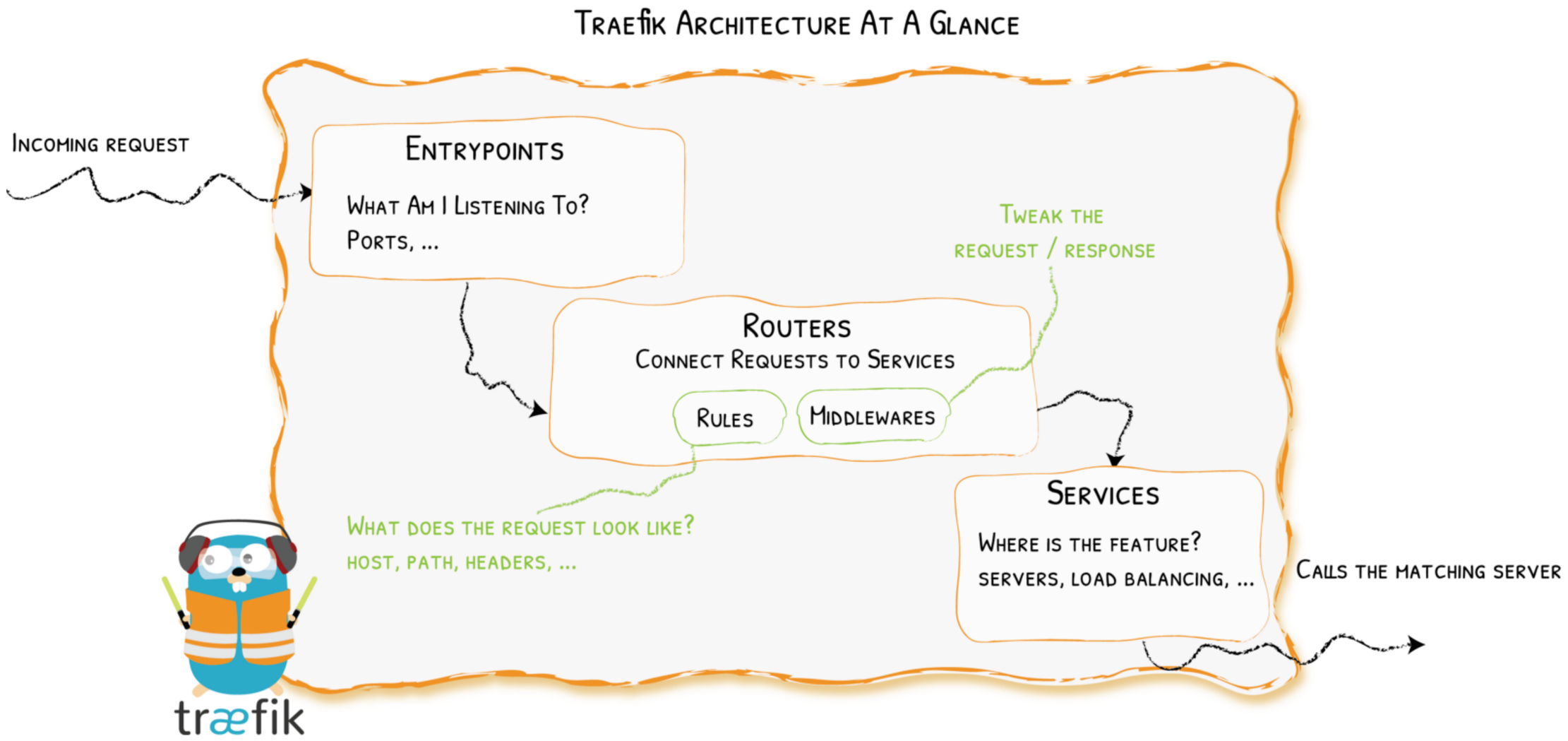
Demo

BACK TO TRAEFIK PART 2.0

Revamped Documentation

Traefik is an open-source *Edge Router* that makes publishing your services a fun and easy experience. It receives requests on behalf of your system and finds out which components are responsible for handling them.

Clarified Concepts

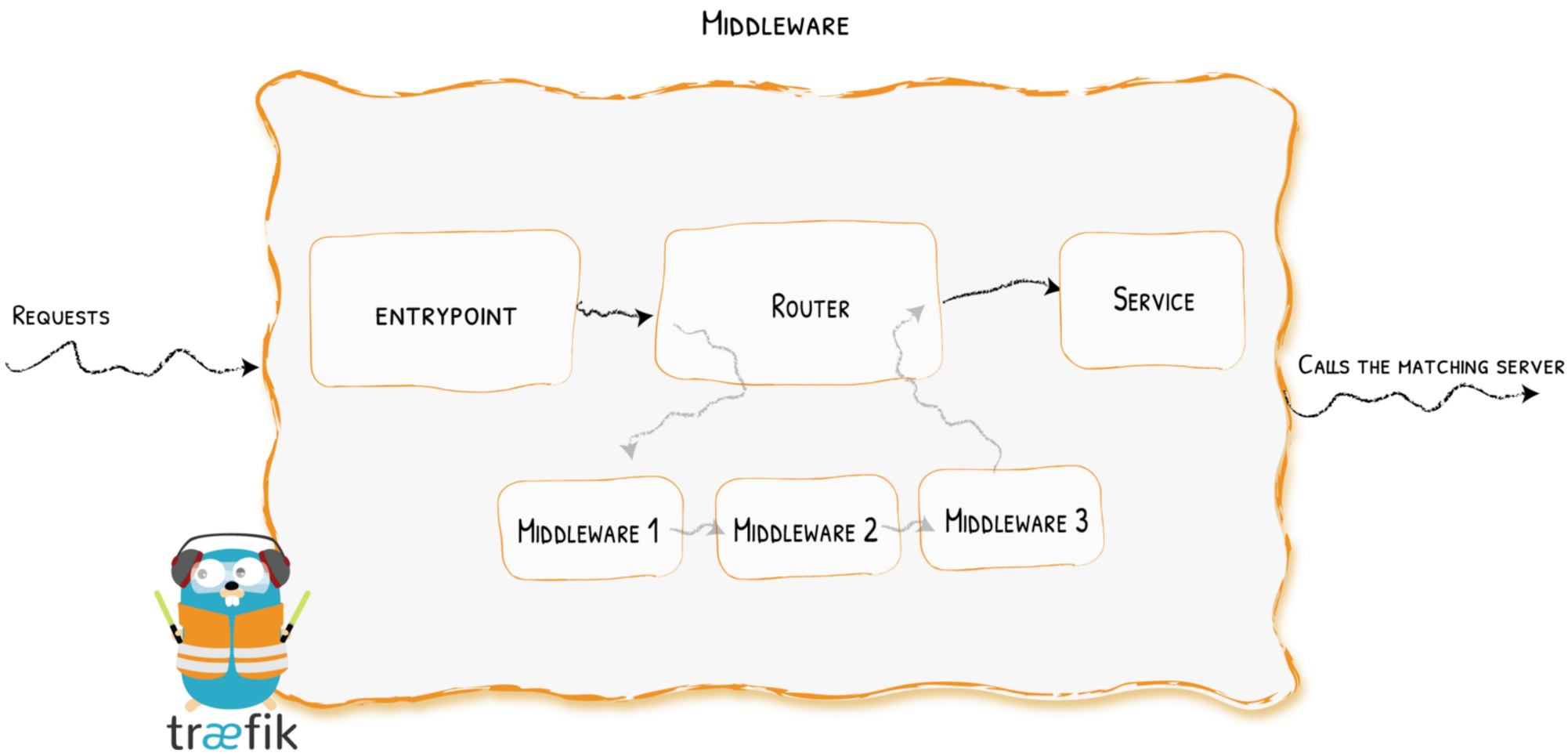


Expressive Routing Rule Syntax


```
# Send both requests to backend service:
#   https://api.mycompany.com/v2
#   https://api-v2.mycompany.com

rule=(Host('api.mycompany.com') && PathPrefix('/v2')) || Host('api-v2.mycompany.com')
```

Middlewares



traefik

HTTP

&

TCP

Quick Glance

```
[entrypoints]
    [entrypoints.web-secure]
      address = ":443"
```

```
[http]
   [http.routers.to-service-1]
      rule = "Host(`demo.containous.cloud`)"
      service = "service-1"
      [http.routers.to-service-1.tls] # terminates the tls connection at HTTP
```

```
[tcp]
   [tcp.routers.to-service-2]
      rule = "HostSNI(`demo.containous.cloud`)"
      service = "service-2"
      [tcp.routers.to-service-2.tls] # terminates the tls connection at TCP
```

```
[tcp.routers.to-service-3]
      rule = "HostSNI(`demo.containous.cloud`)"
      service = "service-3"
      [tcp.routers.to-service-3.tls]
         passthrough = true # sends encrypted data "as is" to service-3
```

And So Much More...

- Learn more on the blog post
- Call for contribution: Grab it, Try it, and give us your feedback!

We Have Stickers!

Thank You!

@michaelmatur

mmatur

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