

# e-Sveučilišta 4.0

Nove ideje, novi svijet

**Rovinj // 5. - 7. 11. 2025.**

# Od paketa do kontejnera

## Osnovni servisi u oblaku

**albert.novak@carnet.hr**

**Sektor za umjetnu inteligenciju**

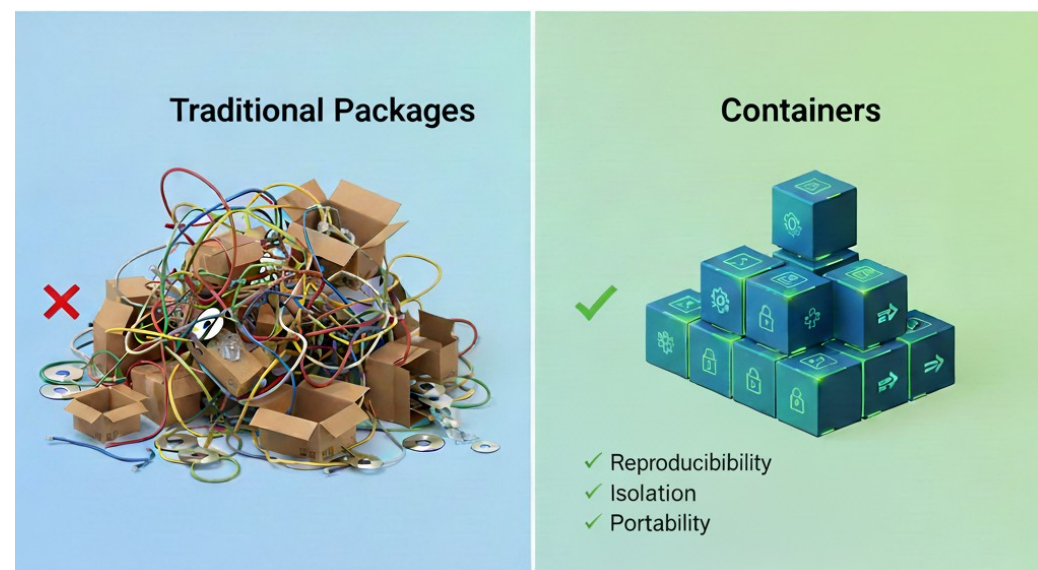
**<https://github.com/anovak006/thecuc2025>**

# Ciljevi pokazne radionice

- Razumjeti prednosti kontejnera nad klasičnim paketima (ponovljivost, izolacija, prenosivost)
- Naučiti definirati i povezati servise, mreže i volumene u Docker Composeu
- Primijeniti Traefik za dinamičko usmjeravanje i TLS
- Osvijestiti kako kontejnerizacija olakšava skaliranje, održavanje i oporavak sustava

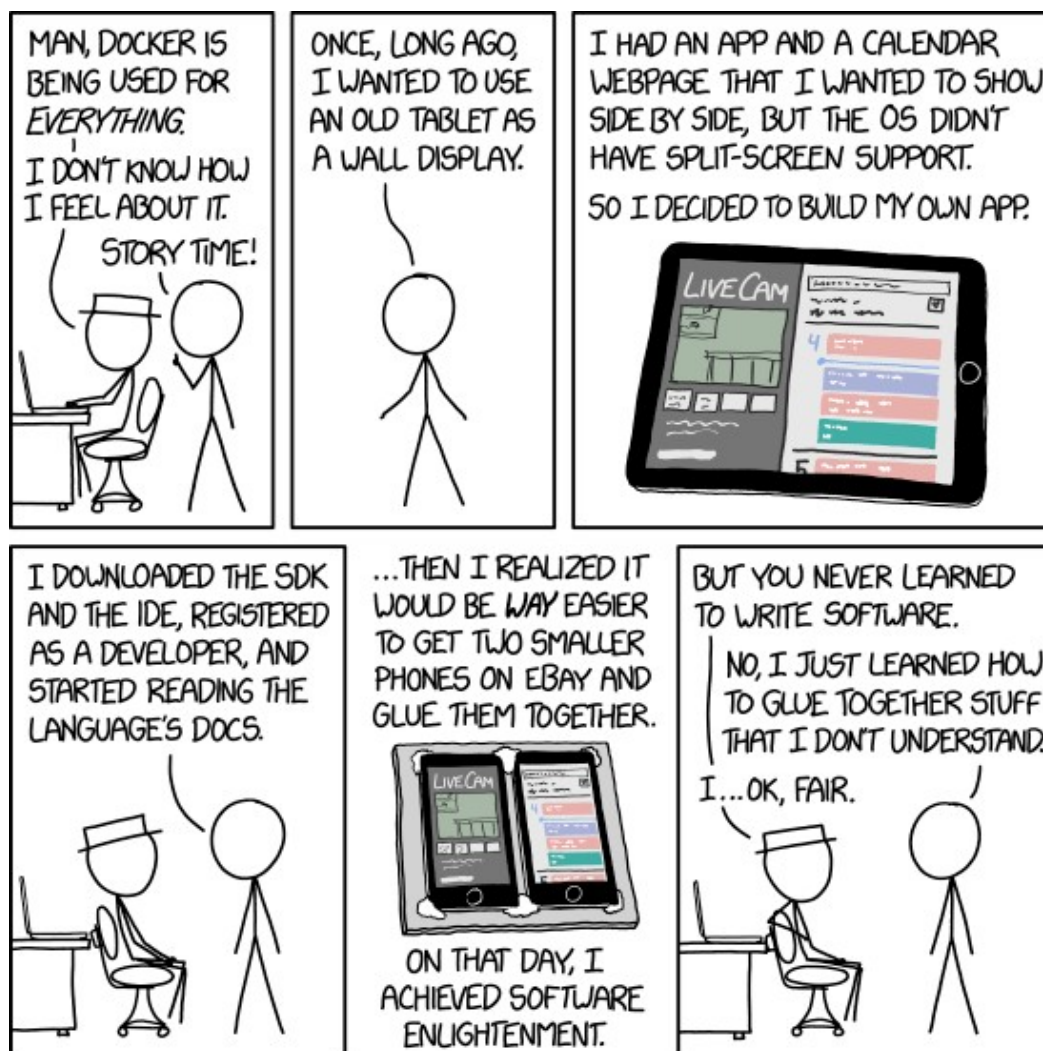
# Zašto kontejneri?

- **Ponovljivost** – isti rezultat na svakoj platformi
- **Izolacija** – svaki servis u svom okruženju
- **Prenosivost** – od laptopa do oblaka
- **Brže podizanje i oporavak sustava**



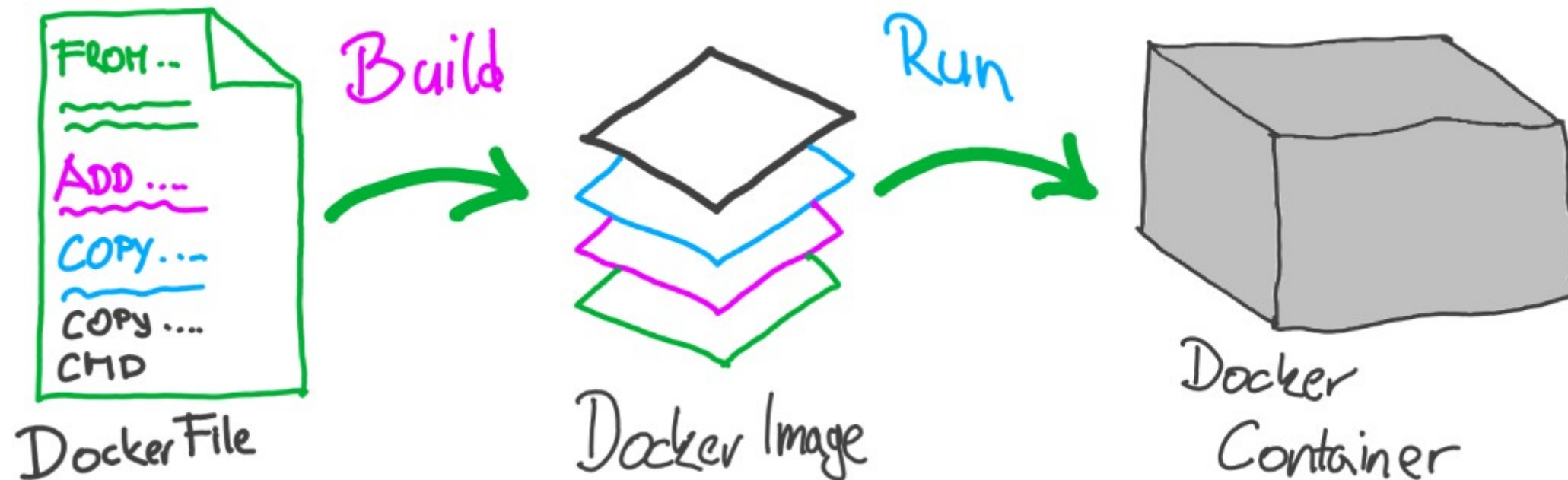
\* Slika je generirana s Google AI Studiom – Nano Banana

# Što su kontejneri?



Izvor: <https://xkcd.com/1988/>, Objašnjenje: [https://www.explainxkcd.com/wiki/index.php/1988:\\_Containers](https://www.explainxkcd.com/wiki/index.php/1988:_Containers)

# Dockerfile -> Docker Image -> Docker Container



Skica je inspirirana s <https://www.geeksforgeeks.org/cloud-computing/what-is-dockerfile/>

# Traefik – pametni reverzni proxy za kontejnere

- **Što je Traefik?**

- Moderni reverzni proxy i load balancer
- Dizajniran za dinamička okruženja (Docker, Kubernetes)

- **Zašto ga trebamo?**

- Automatsko otkrivanje servisa
- Dinamičko usmjeravanje bez ručne konfiguracije
- Integracija s TLS certifikatima (Let's Encrypt)



Izvor: <https://github.com/traefik/traefik/>



# Ključne funkcionalnosti Traefika

- **Dinamičko otkrivanje servisa**
  - Prepoznaje nove kontejnere čim se podignu
- **Automatsko generiranje pravila**
  - Na temelju Docker labela
- **TLS integracija**
  - Let's Encrypt certifikati, automatsko obnavljanje
- **Podrška za više protokola**
  - HTTP, HTTPS, TCP, UDP
- **Monitoring i dashboard**
  - Pregled stanja i metrika

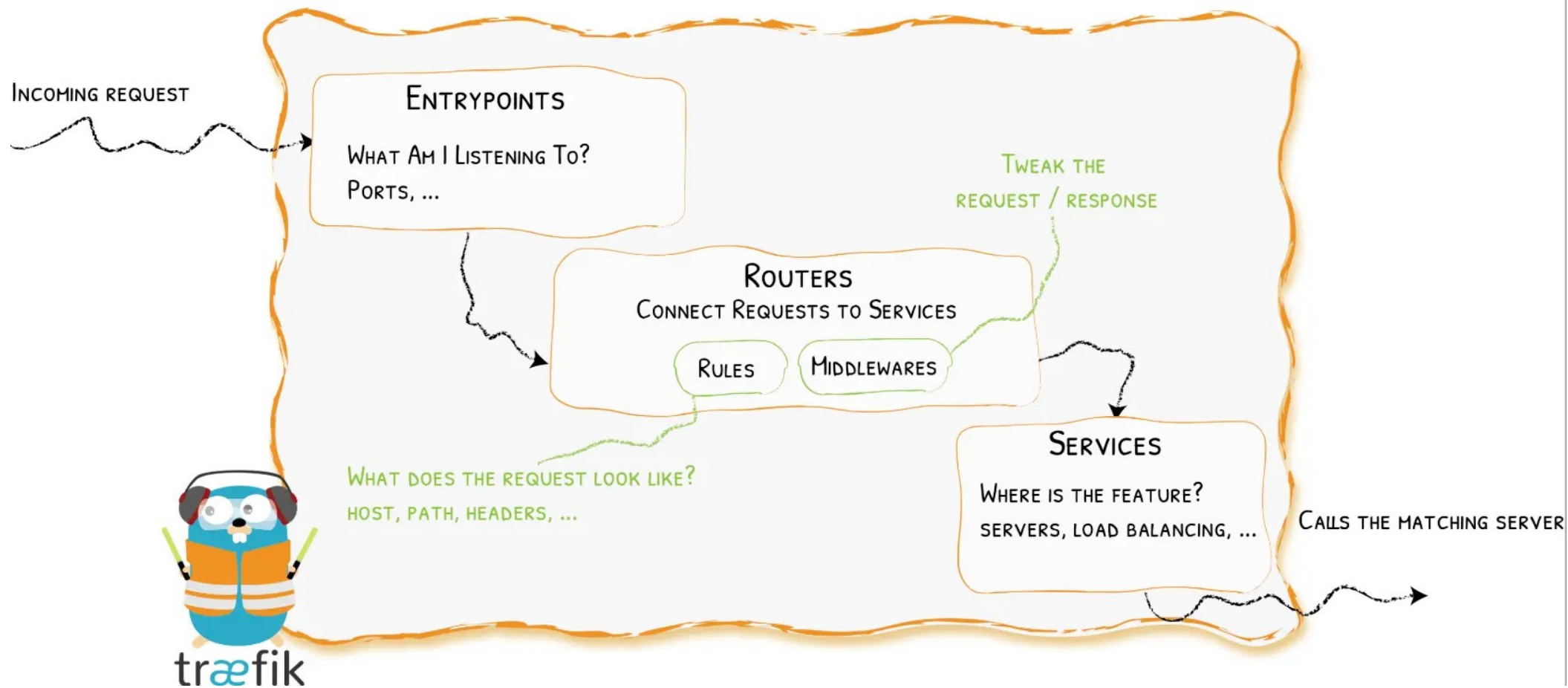
Izvor: <https://github.com/traefik/traefik/>





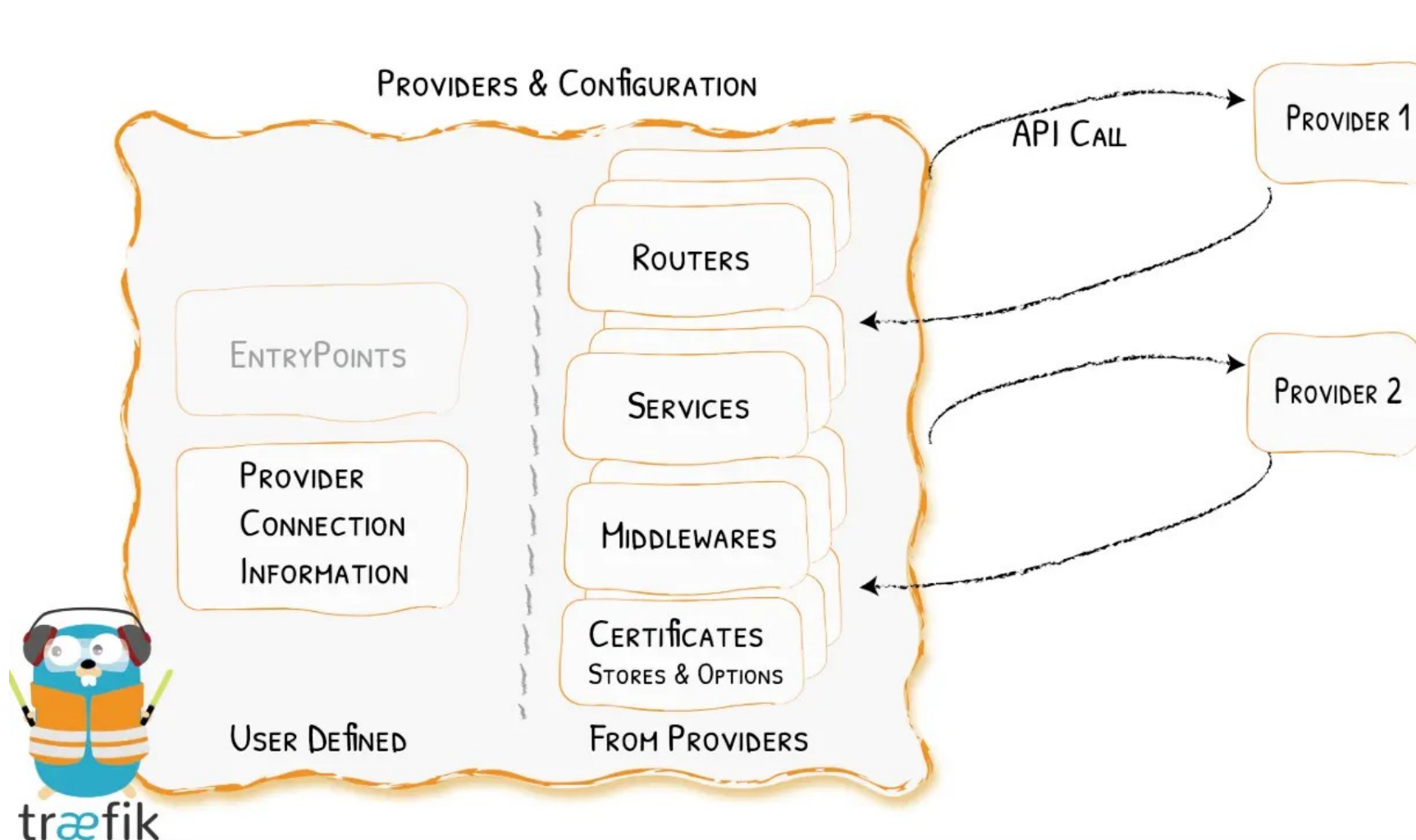
# Traefik arhitektura

## TRAEFIK ARCHITECTURE AT A GLANCE



Izvor: <https://geekyants.com/blog/understanding-traefik-proxy-a-modern-reverse-proxy-and-load-balancer>

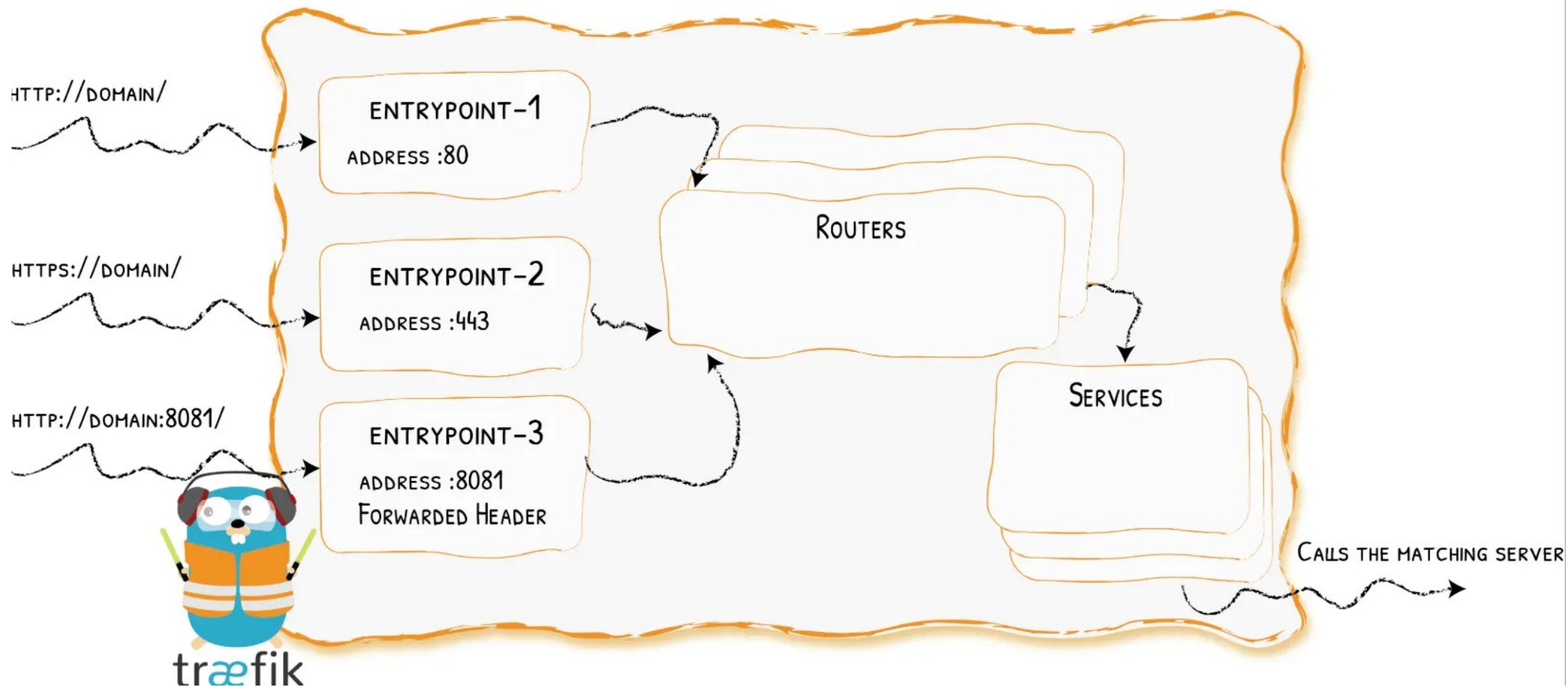
# Pružatelji usluga - provideri



Izvor: <https://geekyants.com/blog/understanding-traefik-proxy-a-modern-reverse-proxy-and-load-balancer>

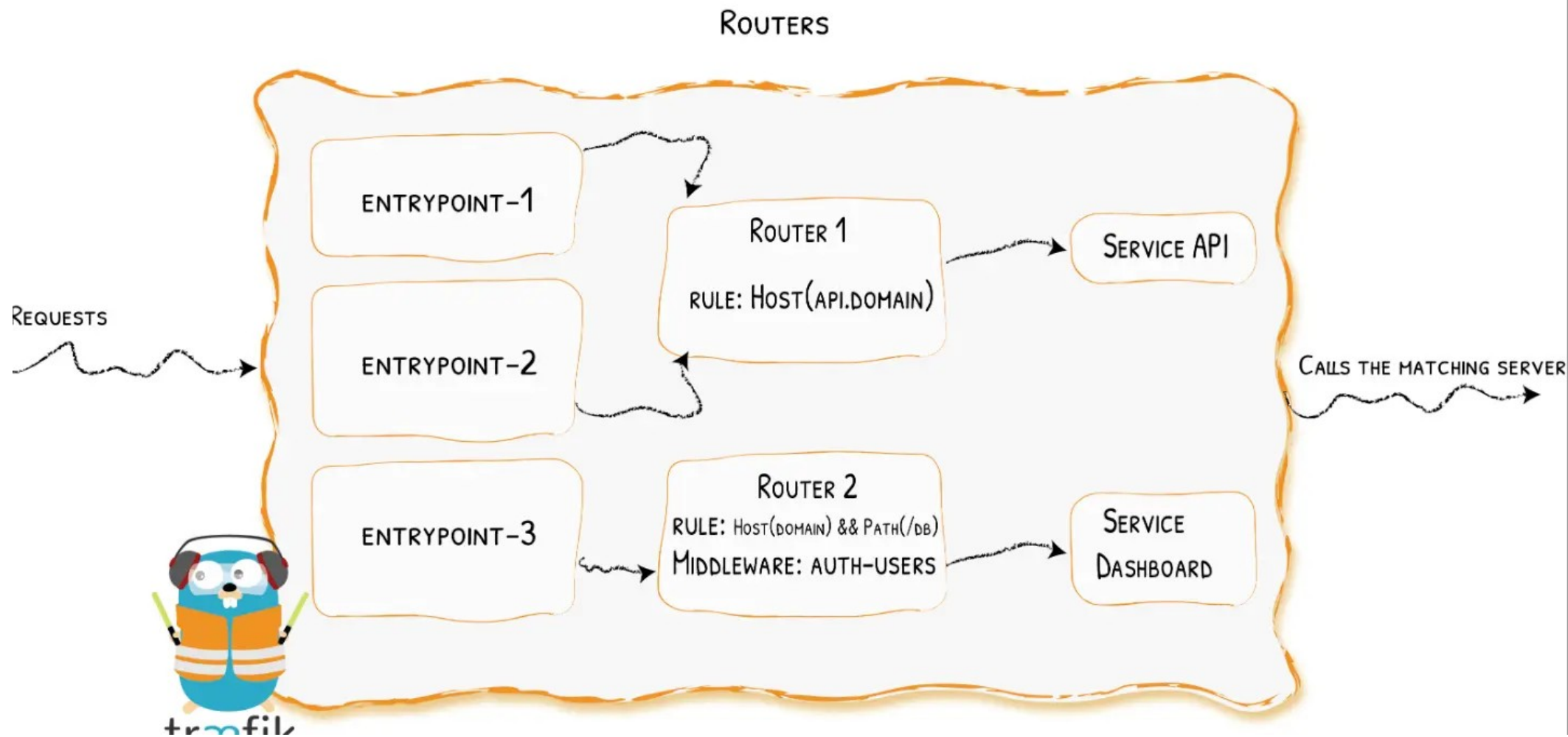
# Ulazne točke - Entrypoints

ENTRYPOINTS



Izvor: <https://geekyants.com/blog/understanding-traefik-proxy-a-modern-reverse-proxy-and-load-balancer>

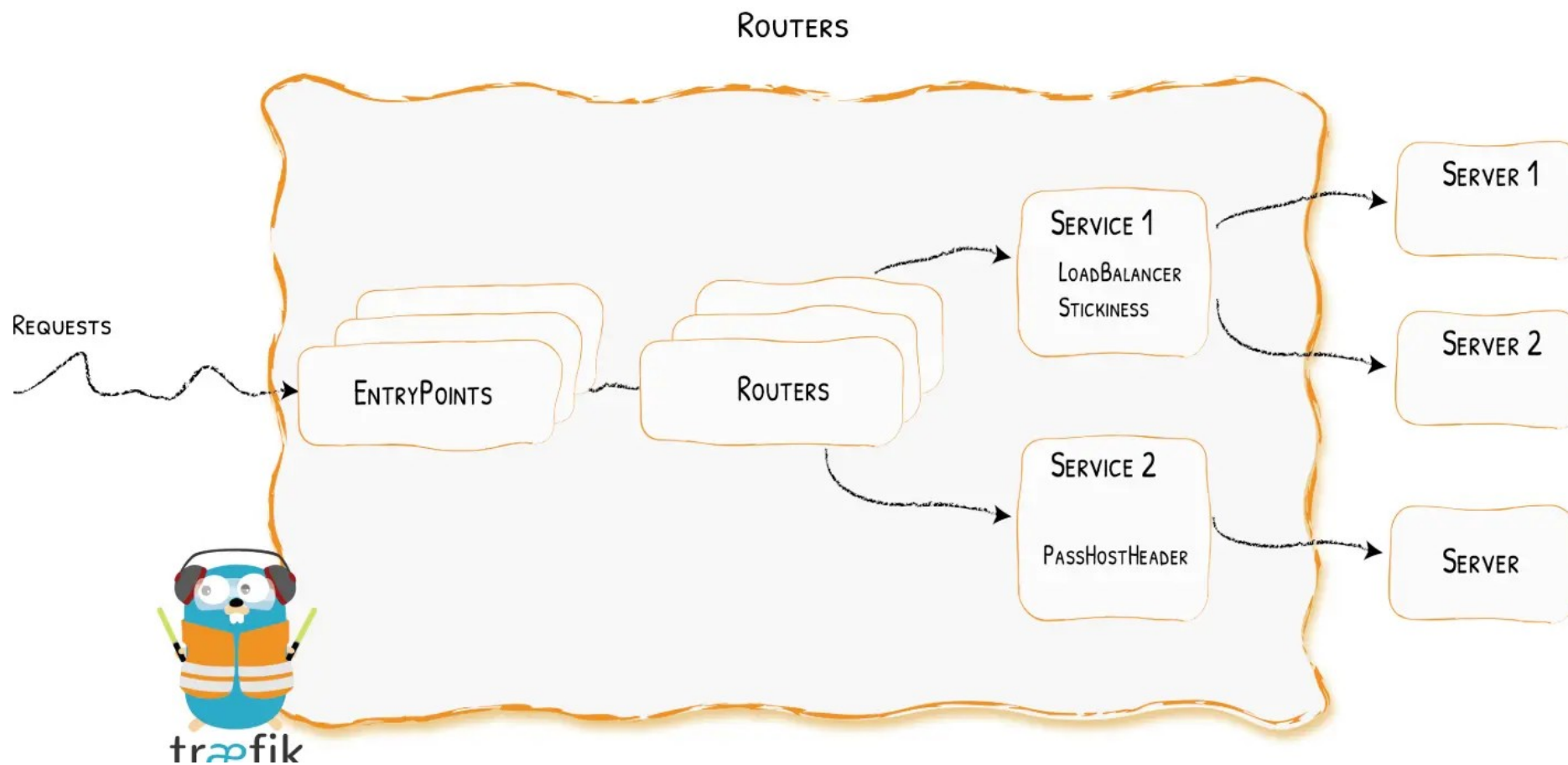
# Usmjerivači - Routers



Izvor: <https://geekyants.com/blog/understanding-traefik-proxy-a-modern-reverse-proxy-and-load-balancer>

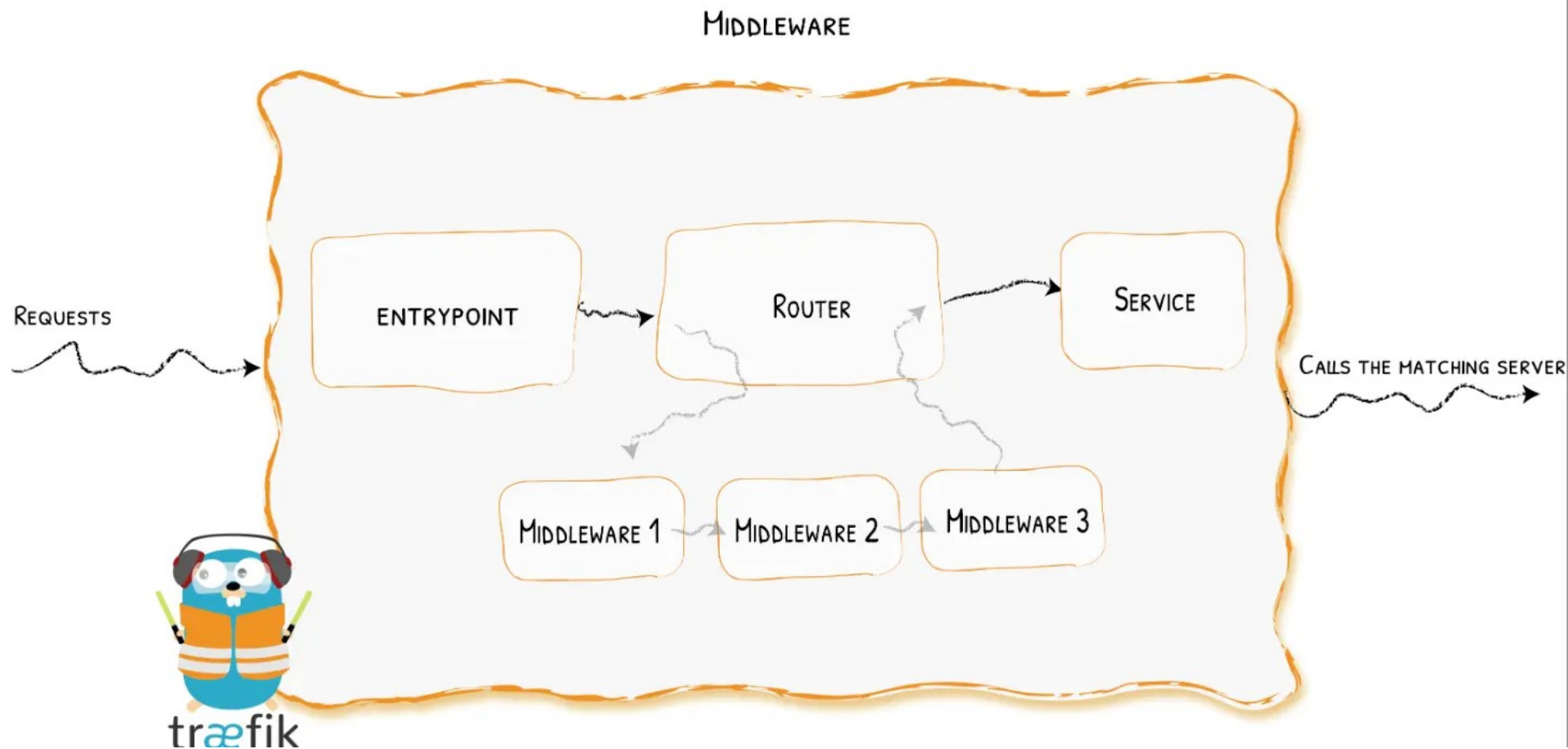


# Usluge - Services



Izvor: <https://geekyants.com/blog/understanding-traefik-proxy-a-modern-reverse-proxy-and-load-balancer>

# Međuprogrami - Middlewares



Izvor: <https://geekyants.com/blog/understanding-traefik-proxy-a-modern-reverse-proxy-and-load-balancer>

# Docker Compose – orkestracija više servisa

- **Što je Docker Compose?**

- Alat za definiranje i pokretanje više kontejnera kao jednog „stacka“

- **Zašto ga koristiti?**

- Jednostavna konfiguracija u YAML formatu
- Automatsko kreiranje mreža i volumena
- Centralizirano upravljanje servisima

- **Ključni pojmovi:**

- services – definiraju kontejnere
- networks – povezuju servise
- volumes – trajni podaci

Poveznica: <https://docs.docker.com/get-started/docker-concepts/the-basics/what-is-docker-compose/>



# Osnovni servisi

- **DNS: Technitium**

- <https://technitium.com/>

- **Radius: FreeRADIUS**

- <https://hub.docker.com/r/freeradius/freeradius-server/>

- **Mail: Mailu**

- <https://mailu.io/>

- **Web: Hugo SSG**

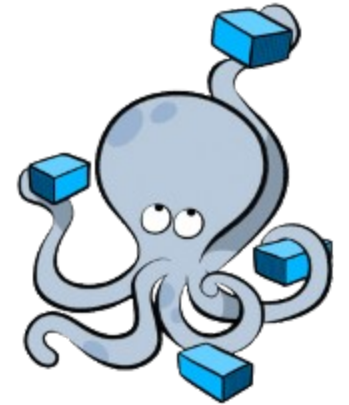
- <https://gohugo.io/>



Poveznica: <https://docs.docker.com/get-started/docker-concepts/the-basics/what-is-docker-compose/>

# Demo

- Ručno kreiranje mreže
- Podizanje/spuštanje stacka
- Uvid u logove
- Traefik dashboard



# Hvala na pažnji!

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