

Grupa .NET Politechnika
Poznańska

CONTAINERS

Sneak peek into the technology transforming the world



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6:30 p.m.
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Today's Agenda

What we'll learn:

1.

Standard model of processing -
Web Applications

2.

Problems that come with this
approach

3.

Containerized workloads - How
do they work?

4.

Big words - Docker, Compose,
Kubernetes, Podman

5.

How these tools solve the
problems of today and the new
problems they generate

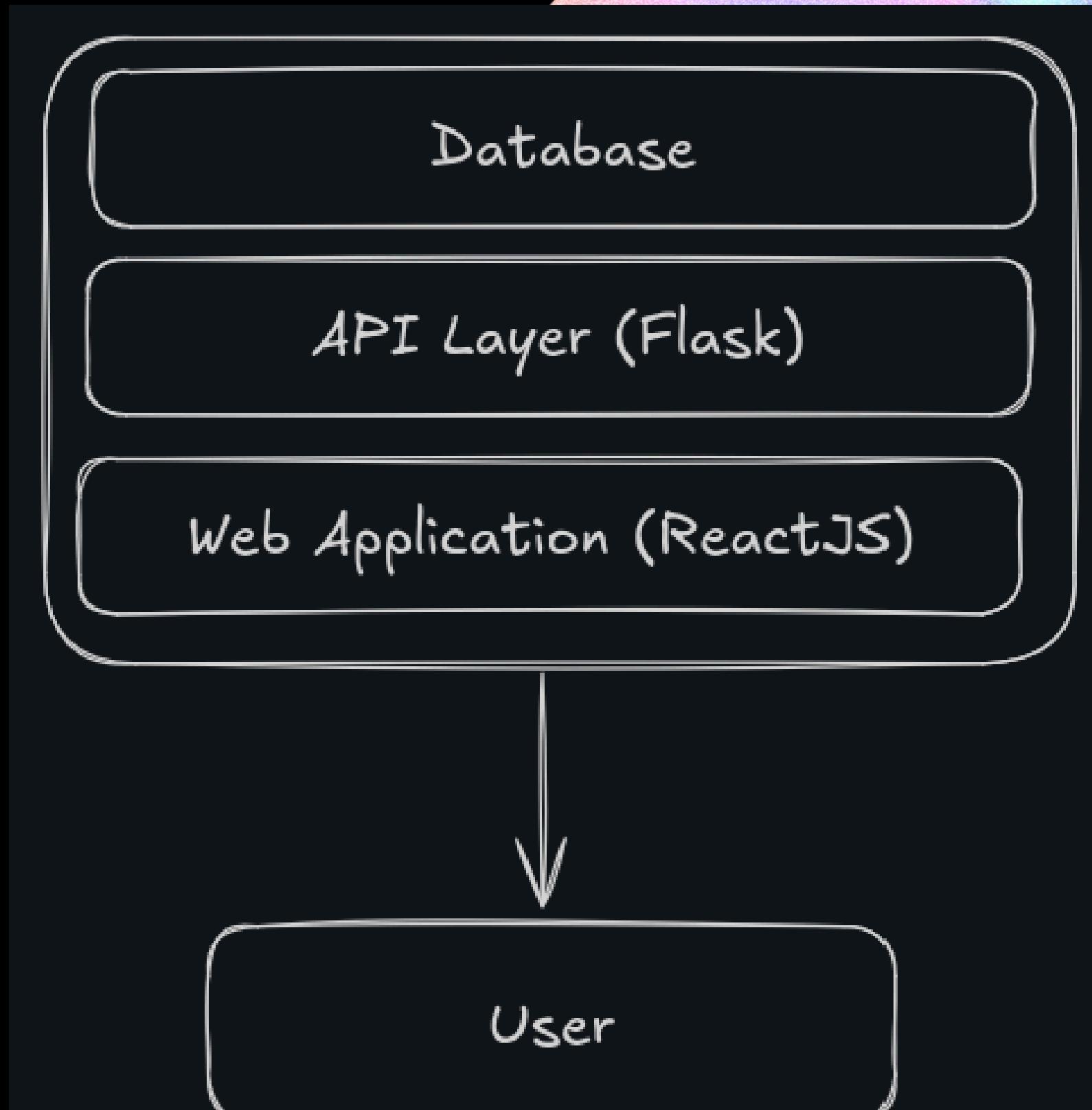
6.

Real-life use cases

Standard model of web processing

Monolithic architecture provides easy-to-understand design

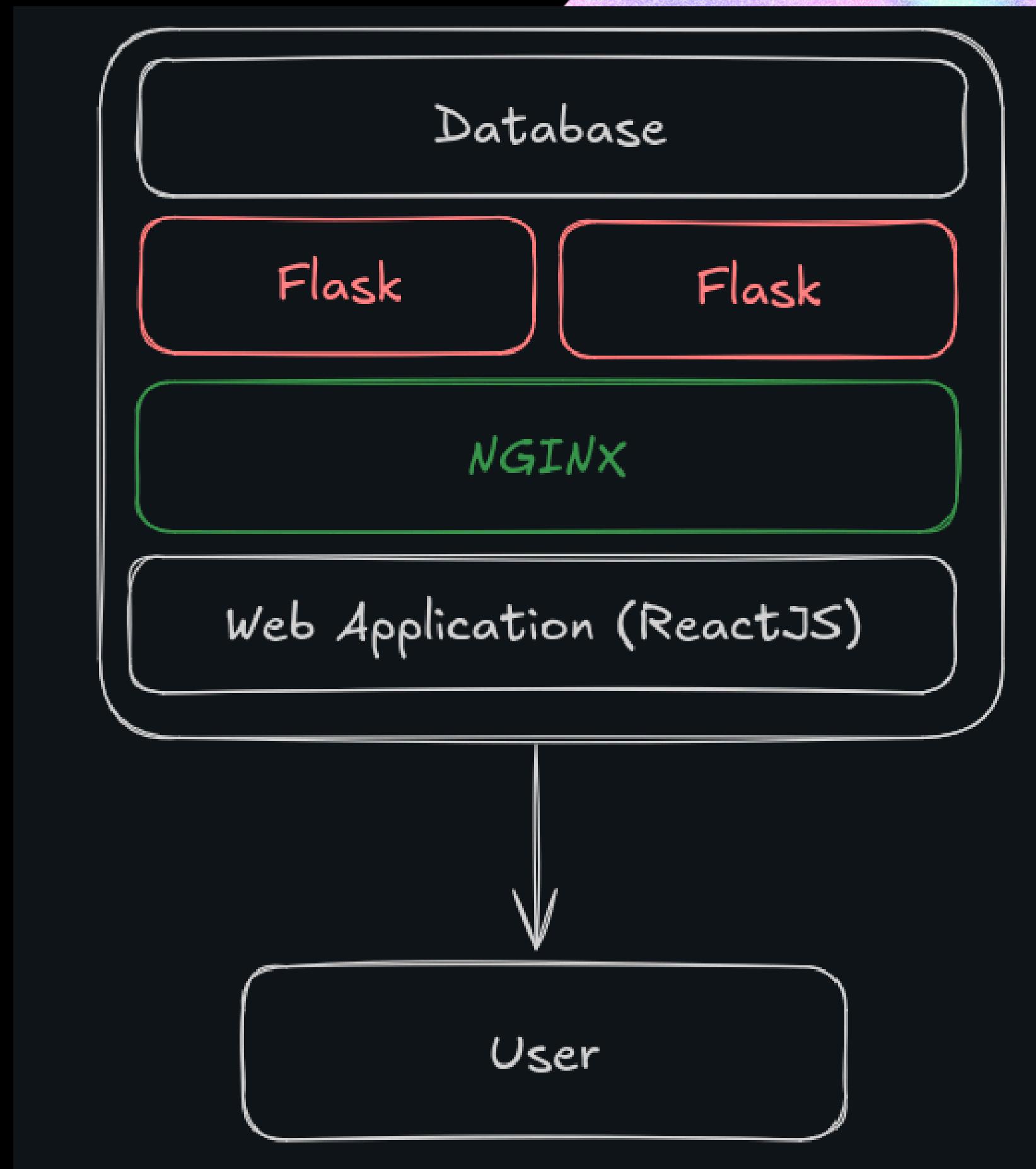
Everything that the application has to offer is neatly packed in a single-machine technology stack.



Problems with monoliths

They are usually very brittle

- Reliability
- Updates
- Scaling
- Environment clashing



CONTAINERS

Running a container locally

1.

Get an image from a repository or build it yourself

Docker Hub has millions of images to choose from. Usually one image means one service.

2.

Tell your runtime to load the image and start the container

You need a way to communicate with your container, open some ports!

3.

Enjoy isolated workflows for life!

All wrapped in a secure by default, easy to understand package

RUNNING UBUNTU
IN 5 SECONDS

Advantages of containerized workloads

1.

Upgrade systems incrementally, automatically

No need to bring down your massive server for a risky update at 3 a.m.

2.

Scale horizontally with no effort at all

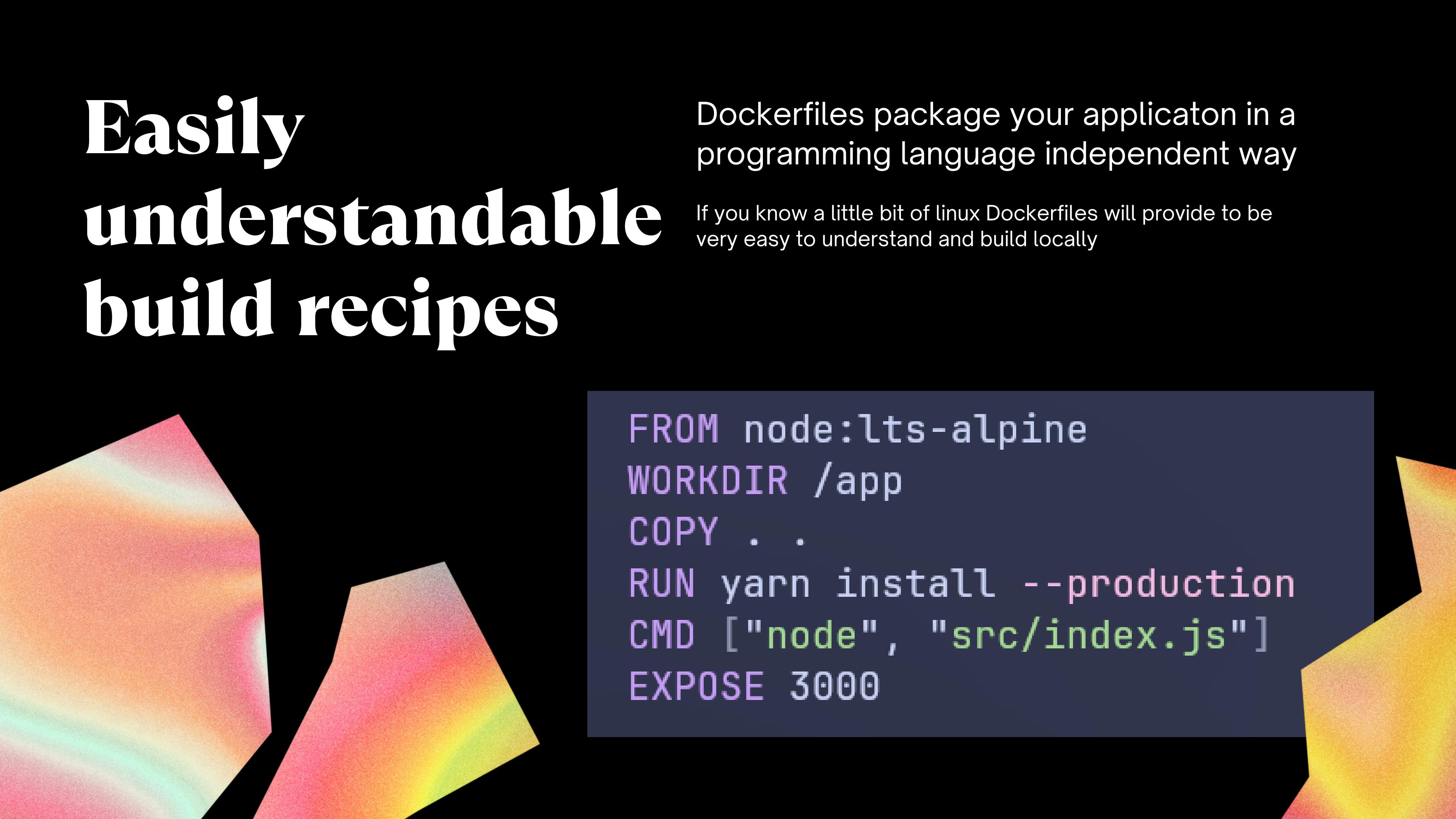
You can now have 50 flask servers running at the same time at 8AM and only 3 at 3AM

3.

“It works on my machine”

We can now ship your machine to the client, using pure magic (and container images)

Easily understandable build recipes



Dockerfiles package your application in a programming language independent way

If you know a little bit of linux Dockerfiles will prove to be very easy to understand and build locally

```
FROM node:lts-alpine
WORKDIR /app
COPY . .
RUN yarn install --production
CMD ["node", "src/index.js"]
EXPOSE 3000
```

UNDERSTANDING THE BIG WORDS

Docker Compose

Storing and running images
in a simple configuration -
removes the need to call
docker run every time

Kubernetes

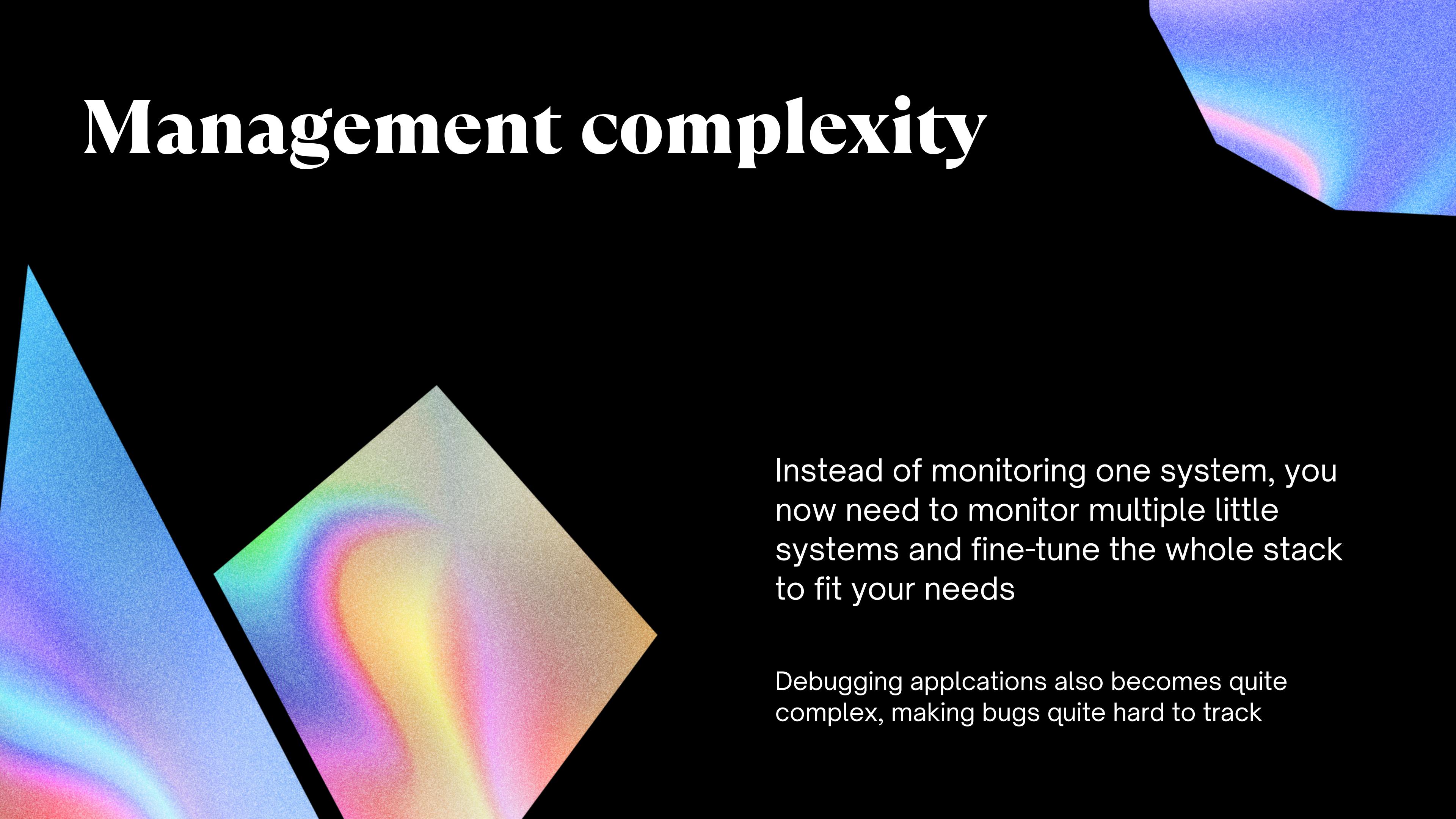
Enterprise grade volume,
image and runtime
configuration, spin up
millions of containers in
thousands of clusters



Drawbacks of this approach

What makes people stray away from container technologies as a whole, apart from vendor lock-in of course.

Management complexity

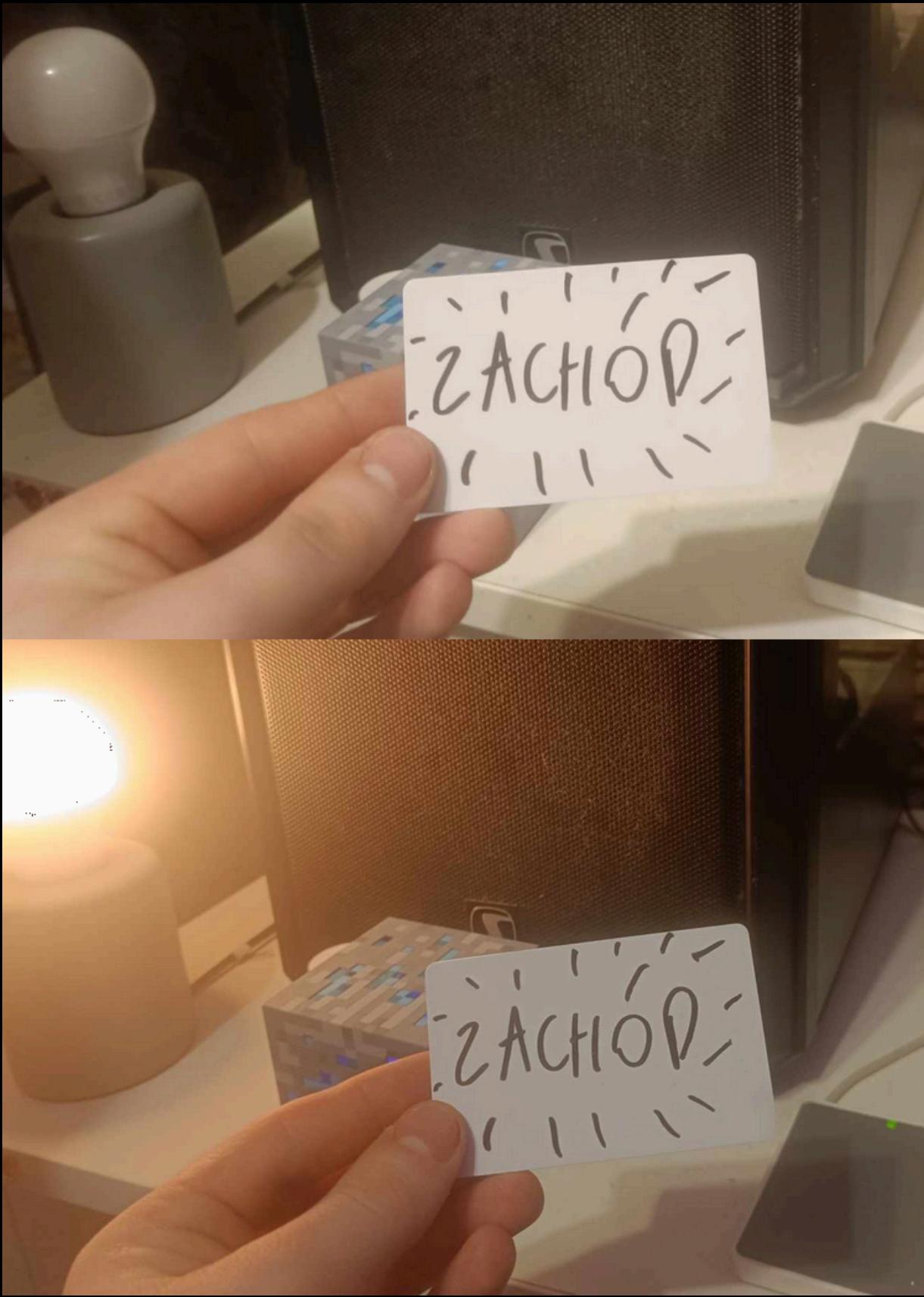
The background features a black surface with three large, semi-transparent triangles. One triangle is blue and positioned in the upper left. Another is a multi-colored gradient (blue, green, yellow, orange) and is located in the lower left. A third triangle, also with a multi-colored gradient (blue, purple, pink, yellow), is in the upper right.

Instead of monitoring one system, you now need to monitor multiple little systems and fine-tune the whole stack to fit your needs

Debugging applications also becomes quite complex, making bugs quite hard to track

REAL LIFE APPLICATIONS

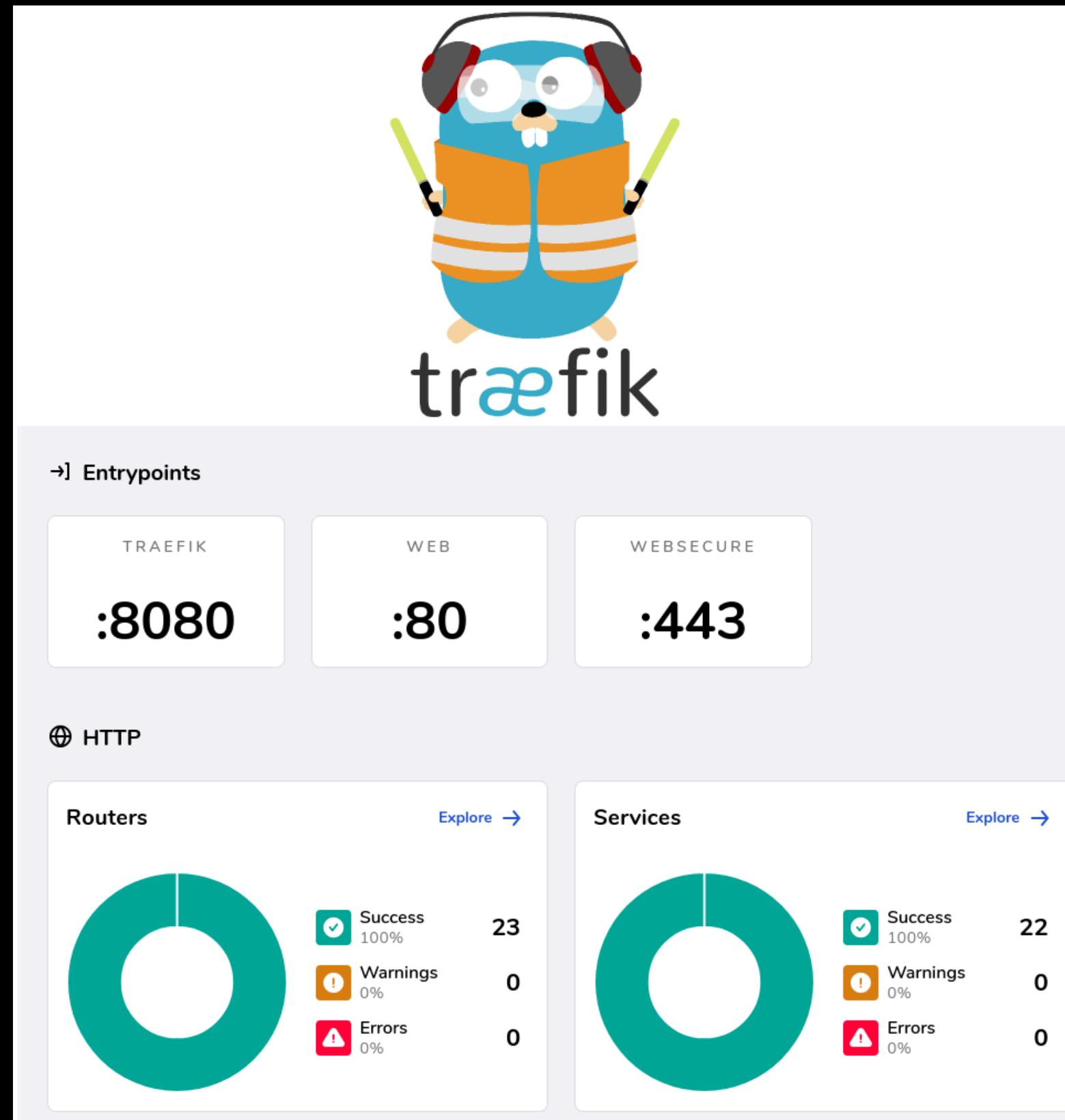
What I used containers for in the last month - a small case study



PCSC - NFC

Bought a NFC reader impulsively,
driver only works on ubuntu

Docker allowed me to package my whole python
application using the driver in a neat image, which
now works on my server!



Traefik Proxy

Traefik provides an easy to configure secure reverse proxy

Allows me to spin up new routes on my website in a matter of minutes, just copy paste the existing config and slap a new image on it! Very useful for hackathons!



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18 hours ago

Bibliografia do licencjatu (robocza; jeszcze bez weryfikacji)

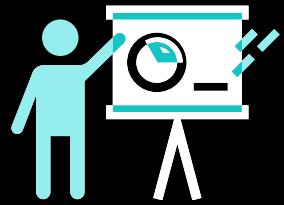
1. Challenges for women : women's studies in Korea and Japan / edited by Shin Chang-hyun et al. Autor: Shin, Chang-hyun
Ewha Womans University Press, 1991.
2. Frauen, erstanden aus dem Krieg : Koreakrieg und dem Koreanischen von Youjung Seo. Autor: Yi, Im-kyung
Tłumacz, Editions Sankt Ottilien. Wydawca EOS, © 2000
4. Przesłonięty uśmiech : o kobietach w Korei Południowej / Anna Sawińska, Anna (1978-). Autor, Wydawnictwo Czarne [reportaż]

Memos

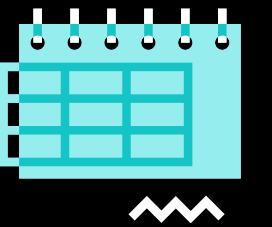
Docker allowed me to create a service to share TODOs with my girlfriend

Makes it quite easy to synchronise and create plans together since there are not many good shared calendars out there

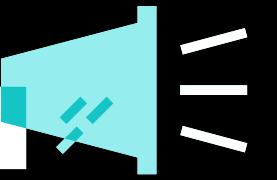
Summary



Monoliths are easy to understand but hard to upgrade and scale



Containers run isolated images from repositories



Images work the same on all machines but managing containers can be very complex



Docker Compose bundles services together. Kubernetes is compose on steroids

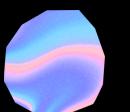


Learning about containers makes deploying a lot of apps very easy and reproducible

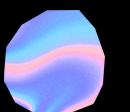
THANK YOU!

Ask away right now or write to me on LinkedIn if you
come up with anything

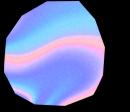
Learn more



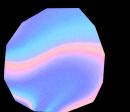
[**https://docs.docker.com/get-started/**](https://docs.docker.com/get-started/)



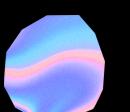
[**https://github.com/awesome-selfhosted/
awesome-selfhosted**](https://github.com/awesome-selfhosted/awesome-selfhosted)



[**https://hub.docker.com/**](https://hub.docker.com/)



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The best way to learn something
is to try it out!