



# Serverless Orchestration

Exploring the Future of Workflow Automation

# This is me



Tim Bossenmaier



Data Engineer @ Cloudflight



Open-Source Contributor



Apache StreamPipes



DataHub



Innsbruck, Austria



Let's connect



bossenti



Tim Bossenmaier

# Agenda

**01**

**Introduction**

**02**

**Tools**

**03**

**Patterns &  
Solutions**

**04**

**Conclusion**



01

# Introduction



## What is *Orchestration*?

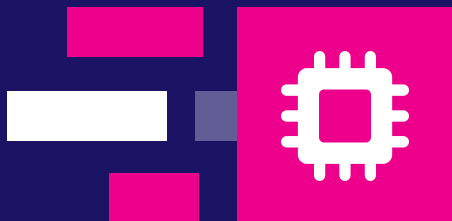
Orchestration describes the coordinated execution of multiple computer systems, application or services.

# Types of Orchestration



## Container

automation and coordination of containers in systems like Docker and Kubernetes

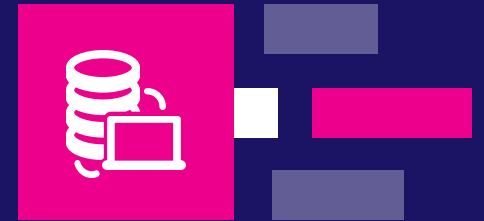


## Application

synchronization and management of two or more software applications

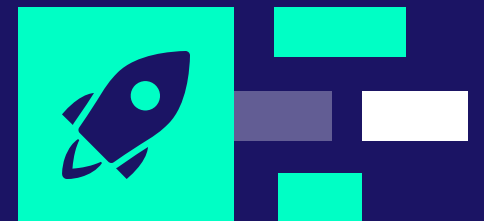
## Workflow

coordinating multiple automated tasks across business applications



## Service

coordination of microservices, networks, APIs, and data services



# Traditional Tools



CRON



Apache  
Airflow



Dagster



Orchestra

Wt9t



Argo  
Workflows



Prefect

An abstract graphic on the left side of the slide. It features a large, dark blue bracket shape that spans the height of the text area. Inside and around this bracket are several horizontal bars of varying lengths and colors, including red, yellow, green, and grey. Some bars are solid, while others are segmented. The background is a solid dark blue.

# What is *Serverless*?

It's a cloud-native development model that allows developers to build and run applications without having to manage servers.



# Types of Compute

## On-Prem

Physical server that you have in your cellar



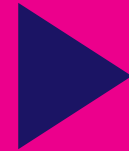
## Cloud

Server (space) you rent from a cloud provider



## Serverless

Pay the compute resources you have used



# I bet you know serverless already

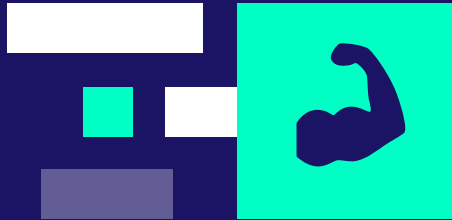


AWS  
Lambda

... is serverless Function as a Service (FaaS) provided by Amazon Web Services

... executes code in response to events and automatically manages the computing resources

# Why combine them?



## Resilience

No orchestration tool to keep running

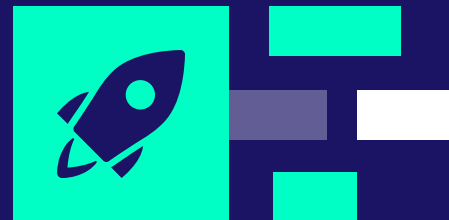
## Cost Efficiency

Only pay for executions



## Scalability

Automatic scaling of workflows

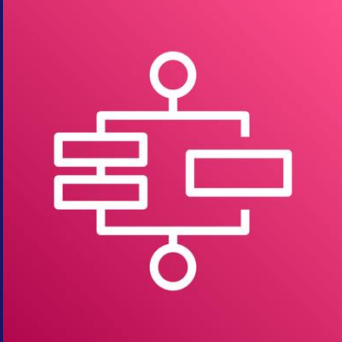




02

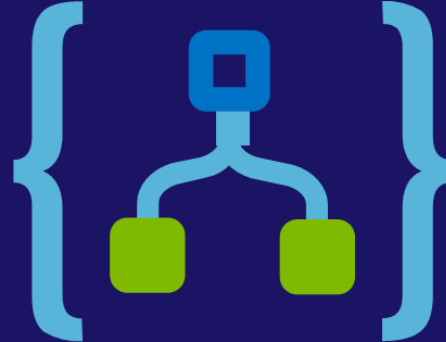
Tools

# Cloud Vendor Offerings



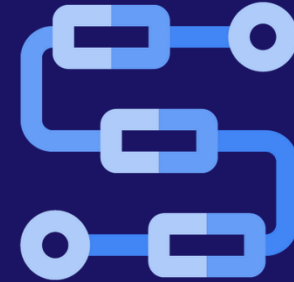
AWS Step  
Functions

A workflow service to create distributed applications, automate processes, orchestrate microservices and create data and ML pipelines



Azure  
Logic Apps

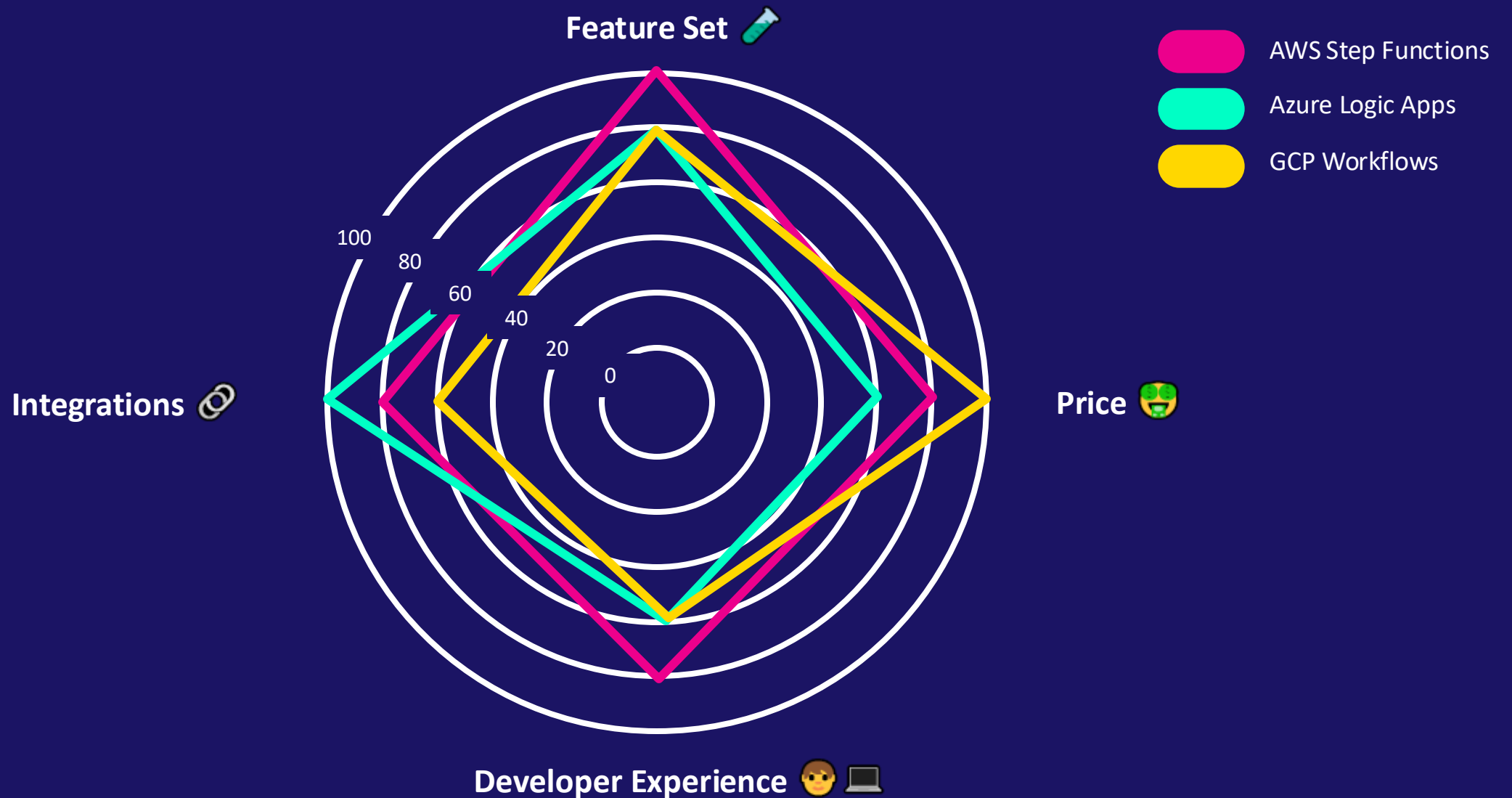
A serverless workflow integration platform that allows you to automate workflows and business processes by integrating various services and applications

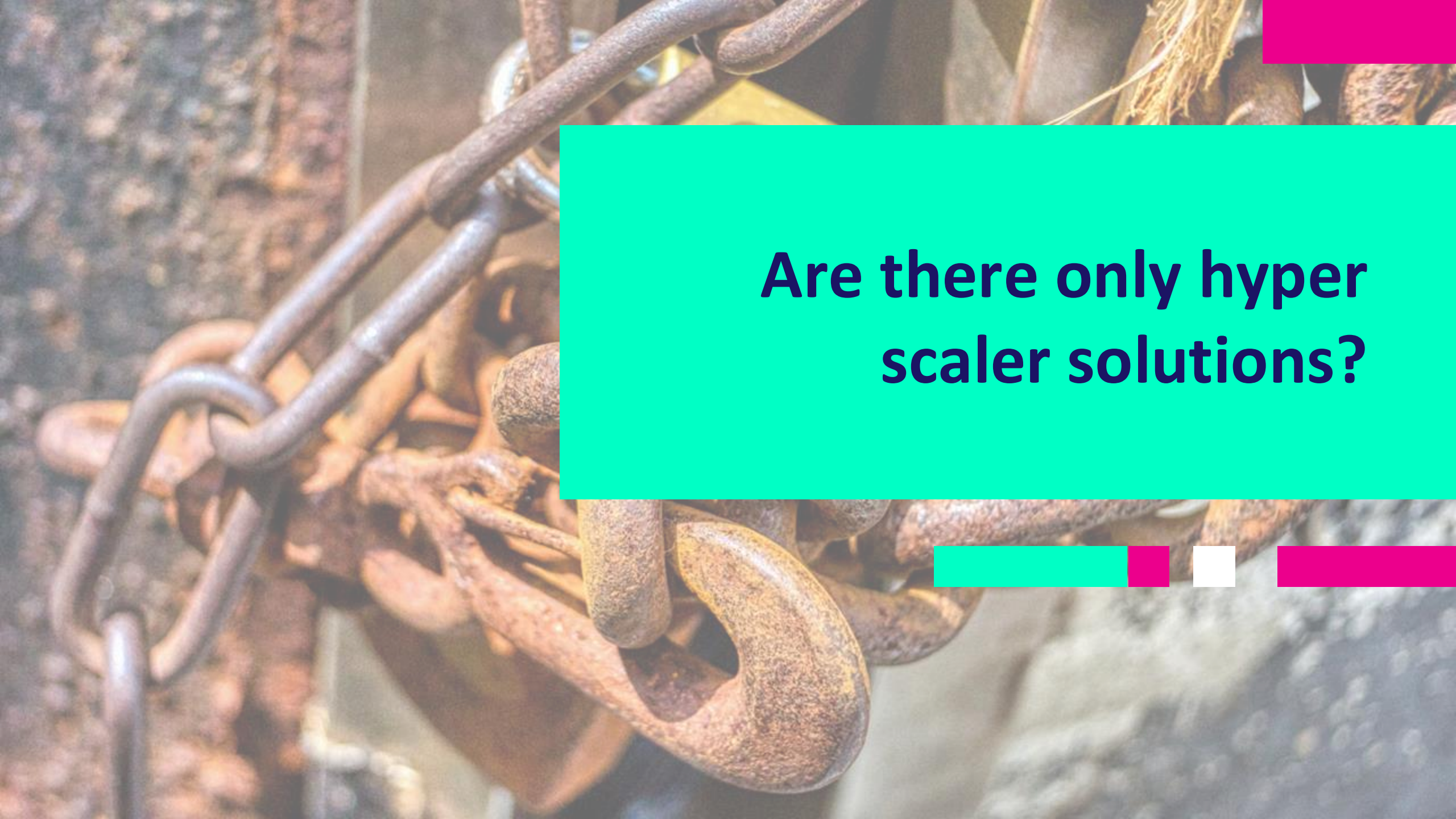


GCP  
Workflows

Combine Google Cloud services and APIs to build reliable applications, process automation, and data and machine learning pipelines.

# Comparison



A close-up photograph of a heavily rusted metal chain and anchor. The chain is made of thick, dark brown links, and the anchor is a large, curved metal piece, both showing significant corrosion. The background is a dark, textured surface, possibly concrete or stone.

**Are there only hyper  
scaler solutions?**



# THERE ARE NOT!

There are also plenty of open-source solutions, for example:

*Argo Workflows*







03

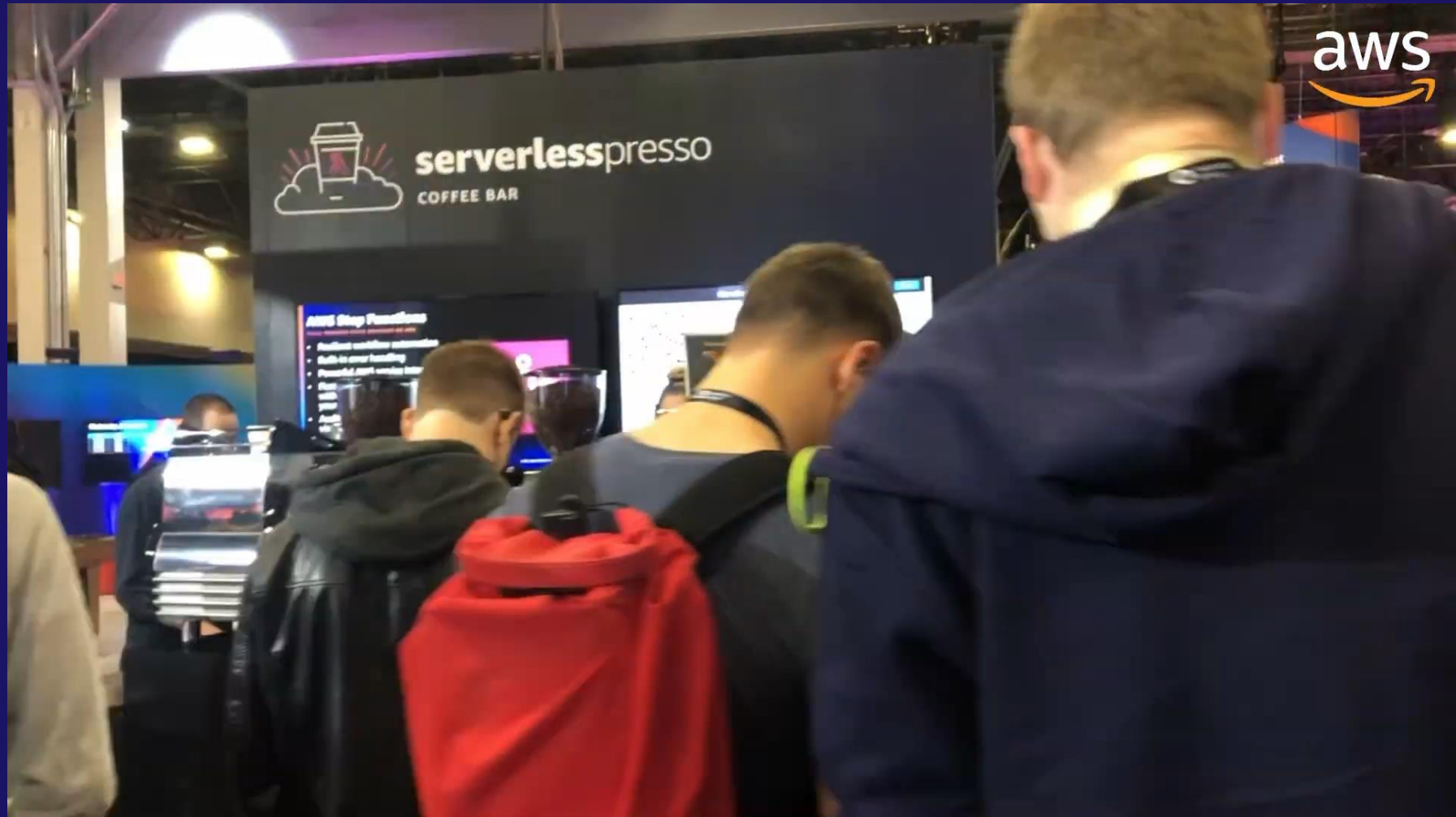
# Patterns & Solutions

# Welcome to the Serverlesspresso ☕

... coffee shop built by only using serverless services

... every order process is managed by AWS Step Functions

... Step Functions maintain order state until completion

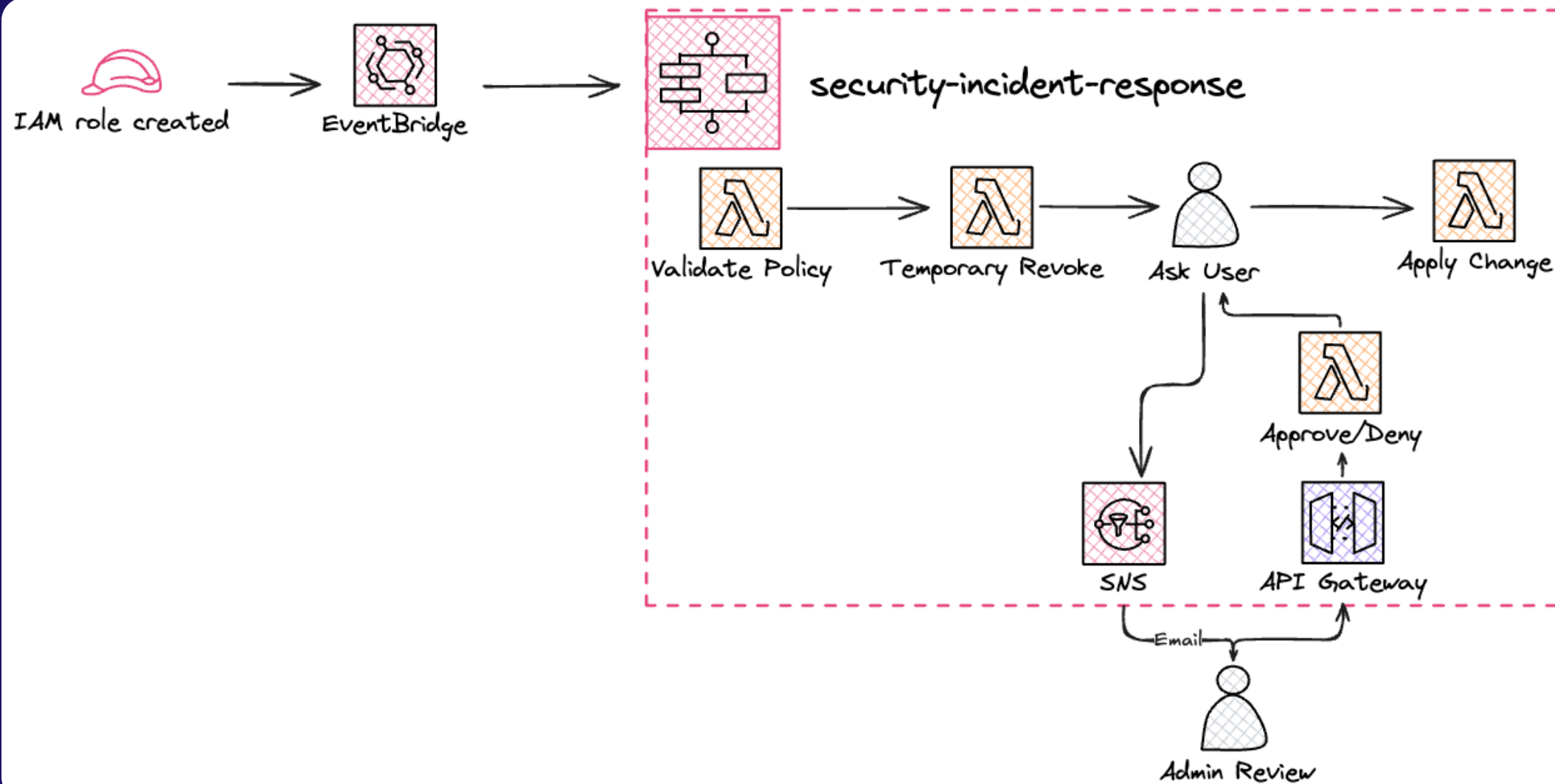


You want that for home? 🏠



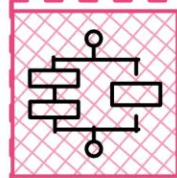
<https://github.com/aws-samples/serverless-coffee>

# IT Security Approval Workflow

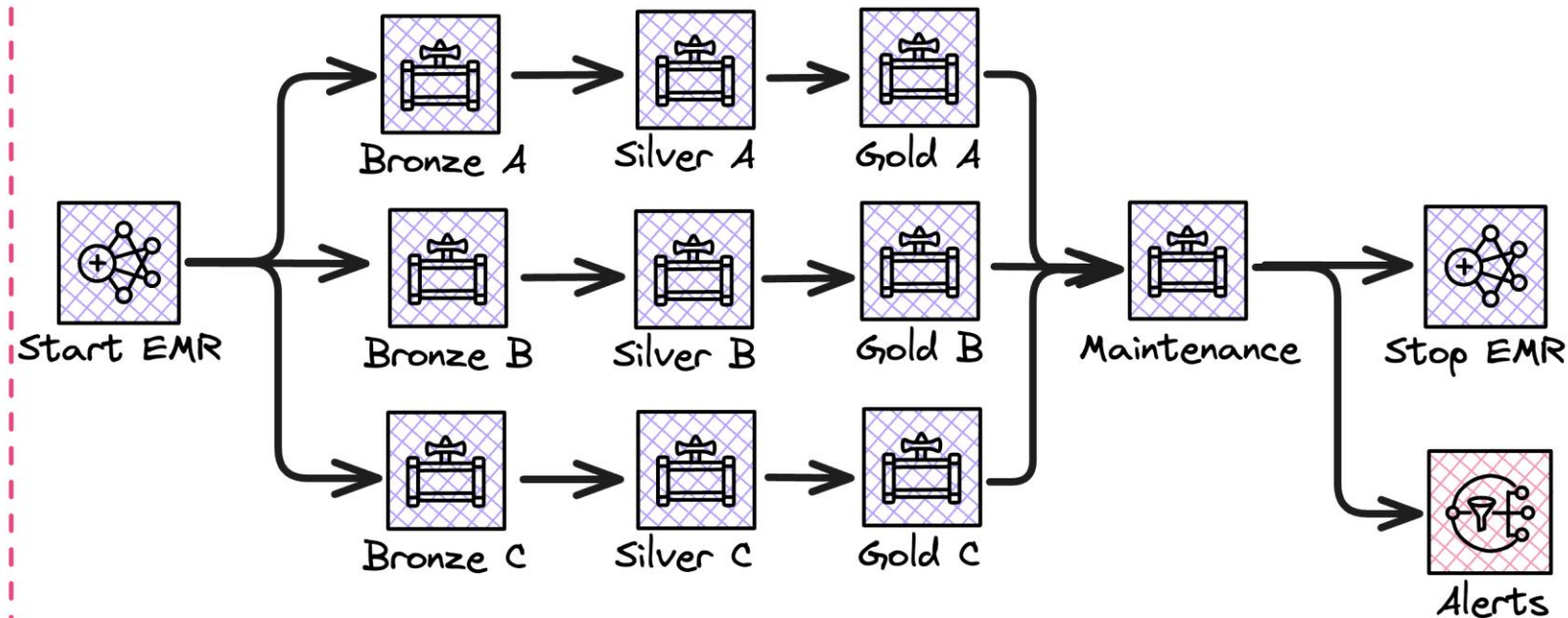


# ETL Pipelines

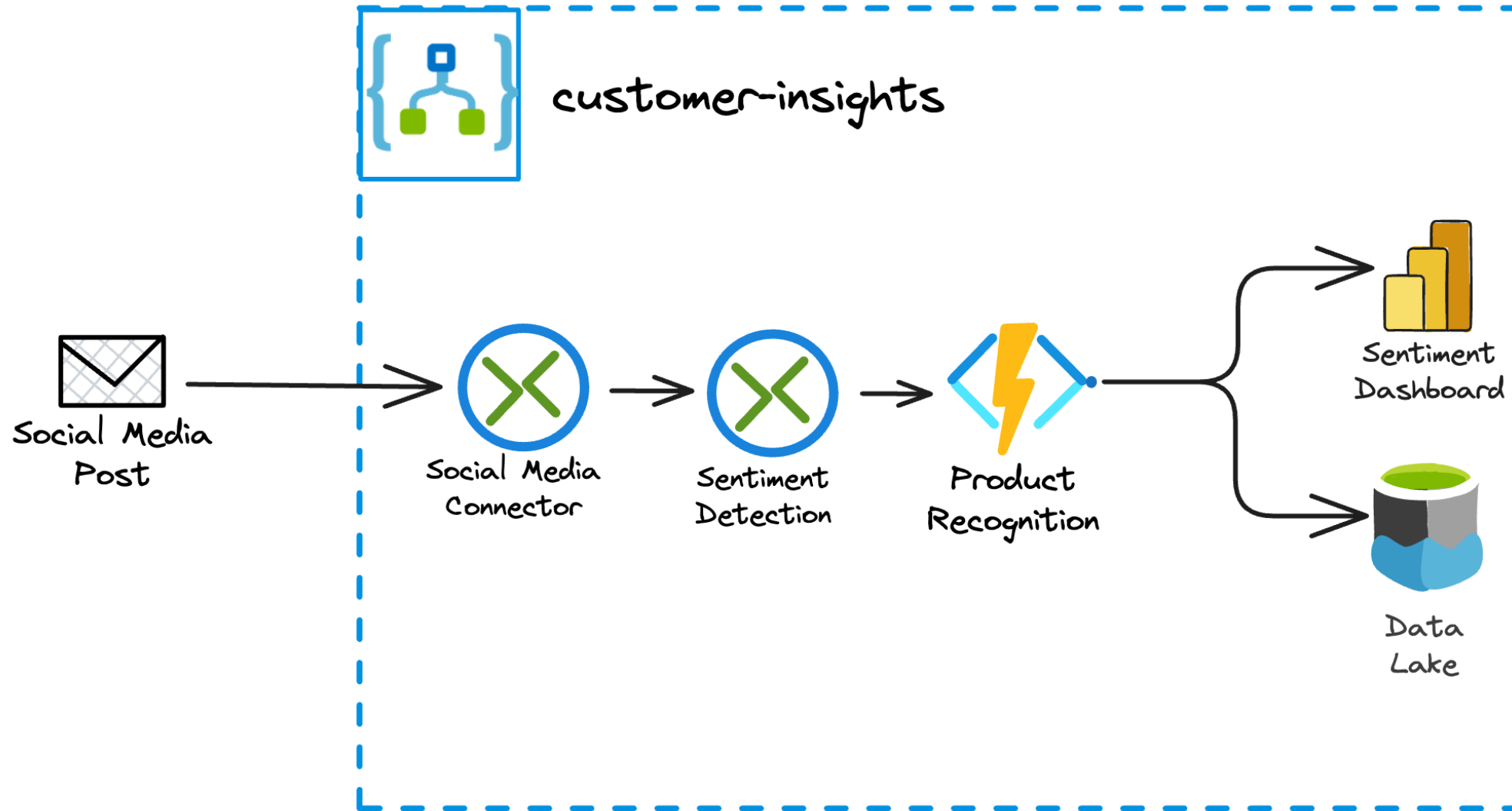
  
EventBridge



daily-etl



# Event-Based Customer Insights

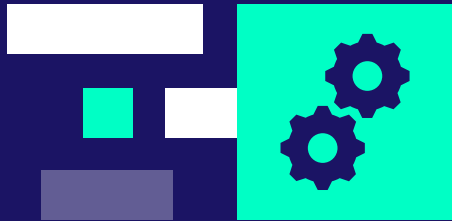




04

Conclusion

# Conclusion

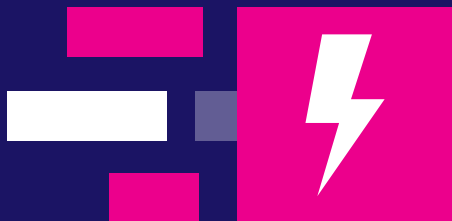
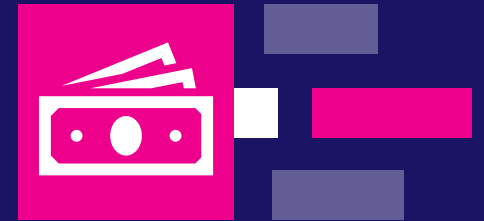


## Operations

Orchestrate workflows with minimal ops overhead

## Cost

Build solutions at low cost

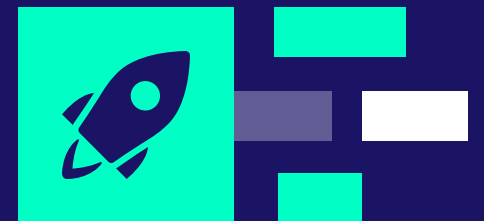


## Event-driven

Perfect fit for event-based workflows

## THE future?

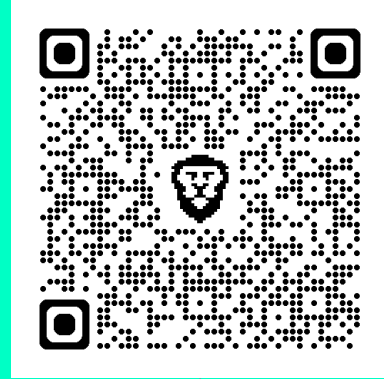
- > Probably not (vendor lock-In, tailored tools)
- > Great extension of developer's toolbox





# THANKS!

Do you have any questions?



Tim Bossenmaier



tim.bossenmaier@cloudflight.io

We are hiring!  
DAs + DEs in DE & AT



Slides