

# Unlocking your serverless functions with OpenFaaS for AI chatbot projects

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#oscon

# About me



- © Operating Systems  
Professor
- © DevOps Consulting
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- © Cloud Architect



# The Idea

Build a tool to create assisted chatbots that automate sales, support, etc., using IM APIs from Telegram, Whatsapp or Facebook



# The needs

- ◎ Fast integration with technologies
- ◎ Short development time
- ◎ Implement DevOps & CI/CD
- ◎ Spend less money on cloud infrastructure
- ◎ Performance
- ◎ Availability

# Chatbots flow

**1**

Read  
parameters  
to create or  
register a  
Chatbot

**2**

Train the AI  
Model

**3**

Create the  
serverless  
function  
structure

# Chatbots flow

**4**

Deploy the  
function in the  
infrastructure

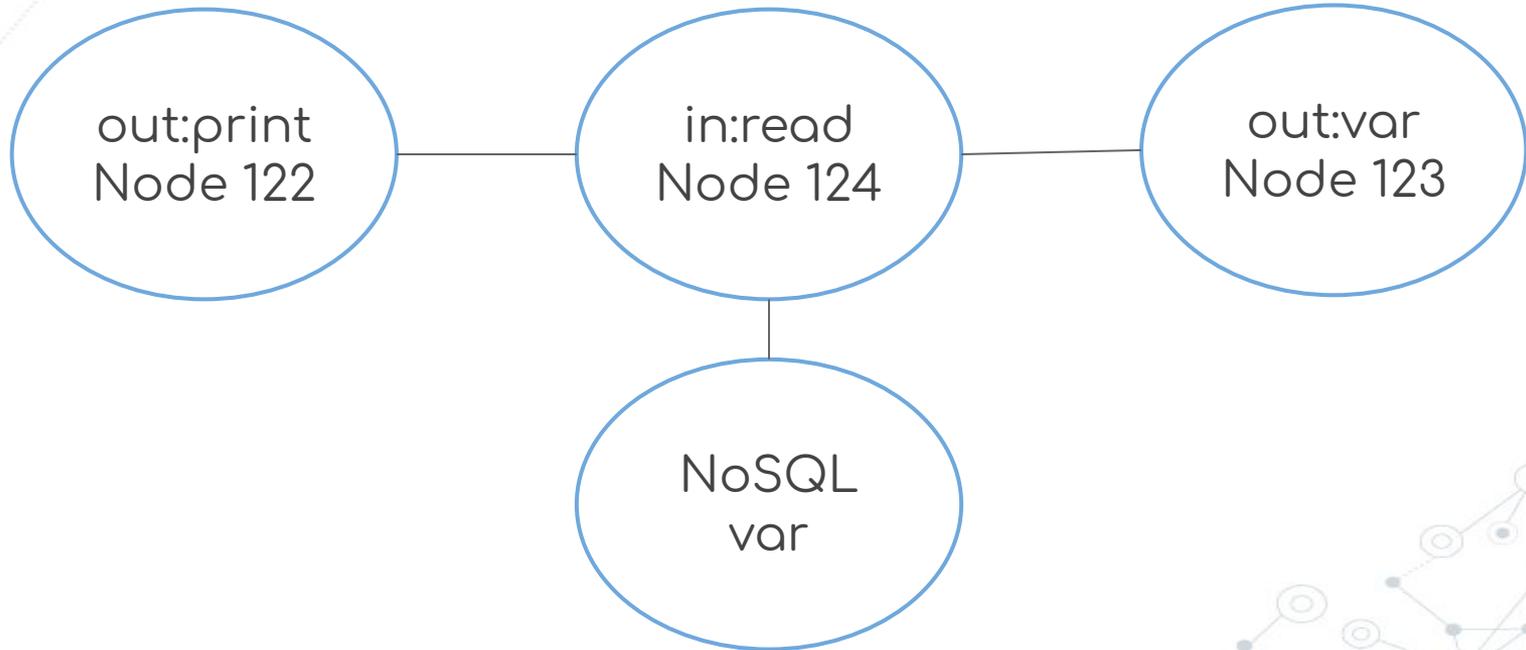
**5**

Set the Chatbot  
Webhook with  
your serverless  
function

**6**

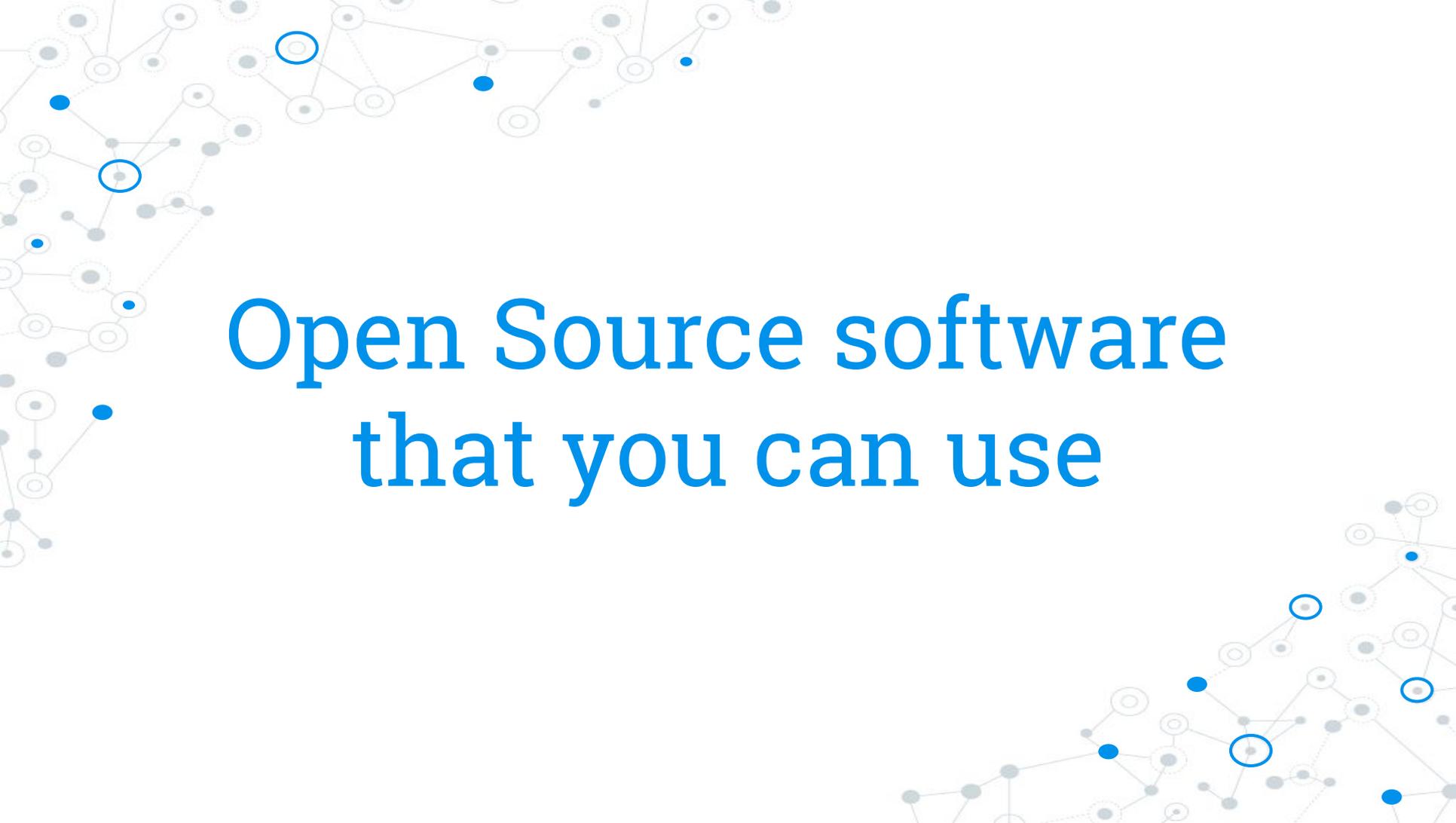
Monitoring  
serverless  
functions

# Visual Programming



# Language Example

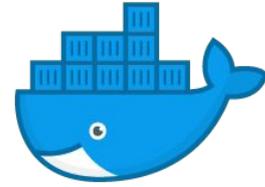
```
{  
  "node_id": "n_123",  
  "security_profiles": "50",  
  "phrase": "\"patterns\"",  
  "type": "out|in",  
  "class": "print|if|jump|read",  
  "parameters": "Enter your age|age%str",  
  "node_rules": {  
    "back_node": "n_122",  
    "next_node": "n_124"  
  }  
}
```

A background graphic consisting of a network of interconnected nodes and lines. The nodes are represented by small circles, some of which are highlighted in blue. The lines are thin and grey, creating a complex web-like structure. The overall aesthetic is clean and modern, typical of a tech or data-related presentation.

Open Source software  
that you can use



**RANCHER**



**docker**



**OPENFAAS**



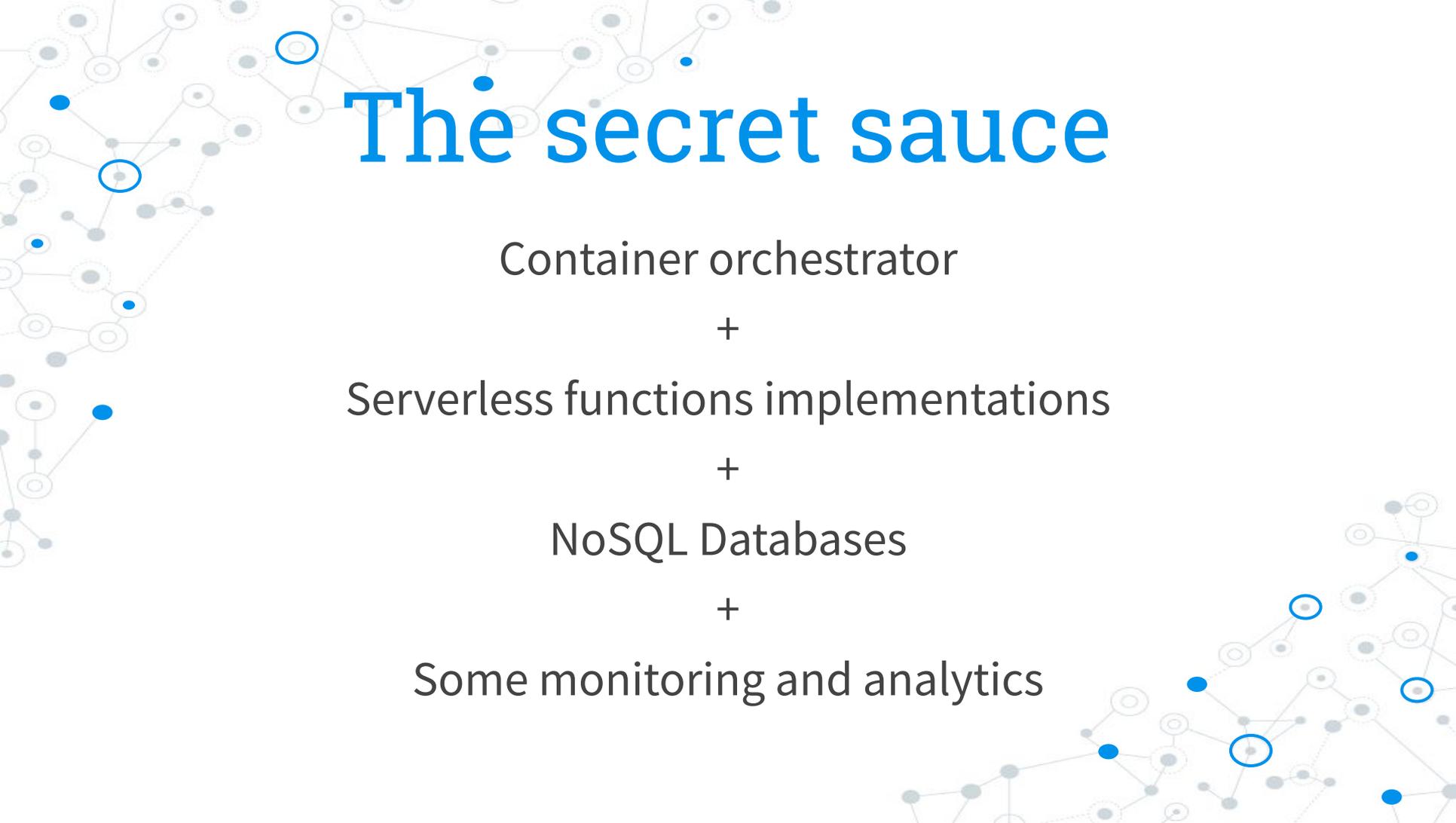
**redis**



RabbitMQ



Prometheus

A background network diagram consisting of interconnected nodes and lines. Some nodes are highlighted with blue circles or dots, while others are grey. The network is more dense on the left and right sides of the slide.

# The secret sauce

Container orchestrator

+

Serverless functions implementations

+

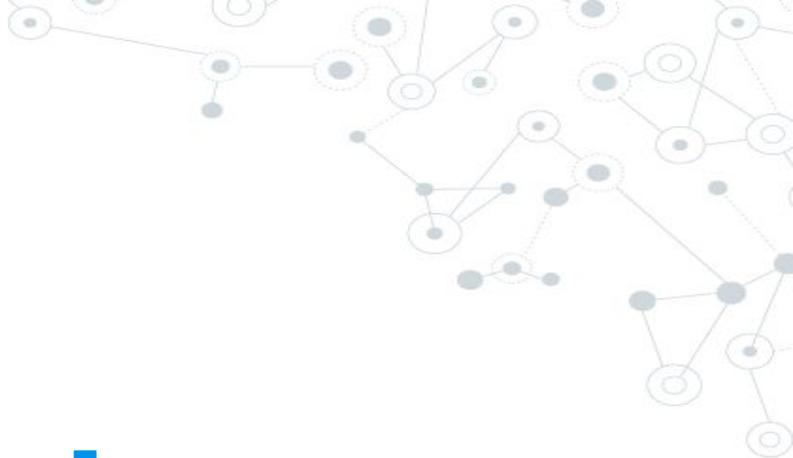
NoSQL Databases

+

Some monitoring and analytics

A decorative background graphic consisting of a network of interconnected nodes and lines. The nodes are represented by small circles, some of which are solid blue, some are hollow blue, and some are solid grey. The lines connecting them are thin and light grey. The network is more dense on the left and right sides of the page, with a clear gap in the center where the text is located.

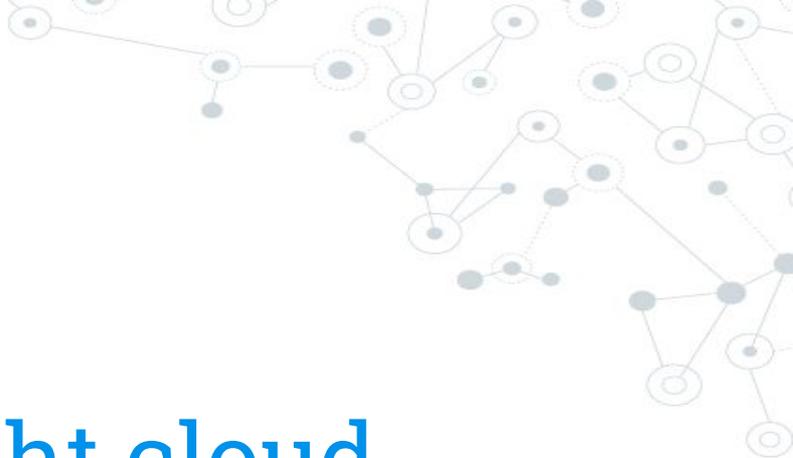
Let's go in deep



# The Cloud

# The Cloud Considerations

- ◎ You are currently using some cloud provider(AWS, GPC, Azure, DO)
- ◎ You have a contract to use some cloud services through to external provider
- ◎ You want to improve development speed and quality of your software
- ◎ Spend less money on infrastructure



Which is the right cloud provider?



Depends on your needs  
and the nature of your  
application



# Associated technologies and their roles

# Chatbots generation process



Chatbots  
manager GUI

1

Logic and AI  
chatbot  
model  
generation

2

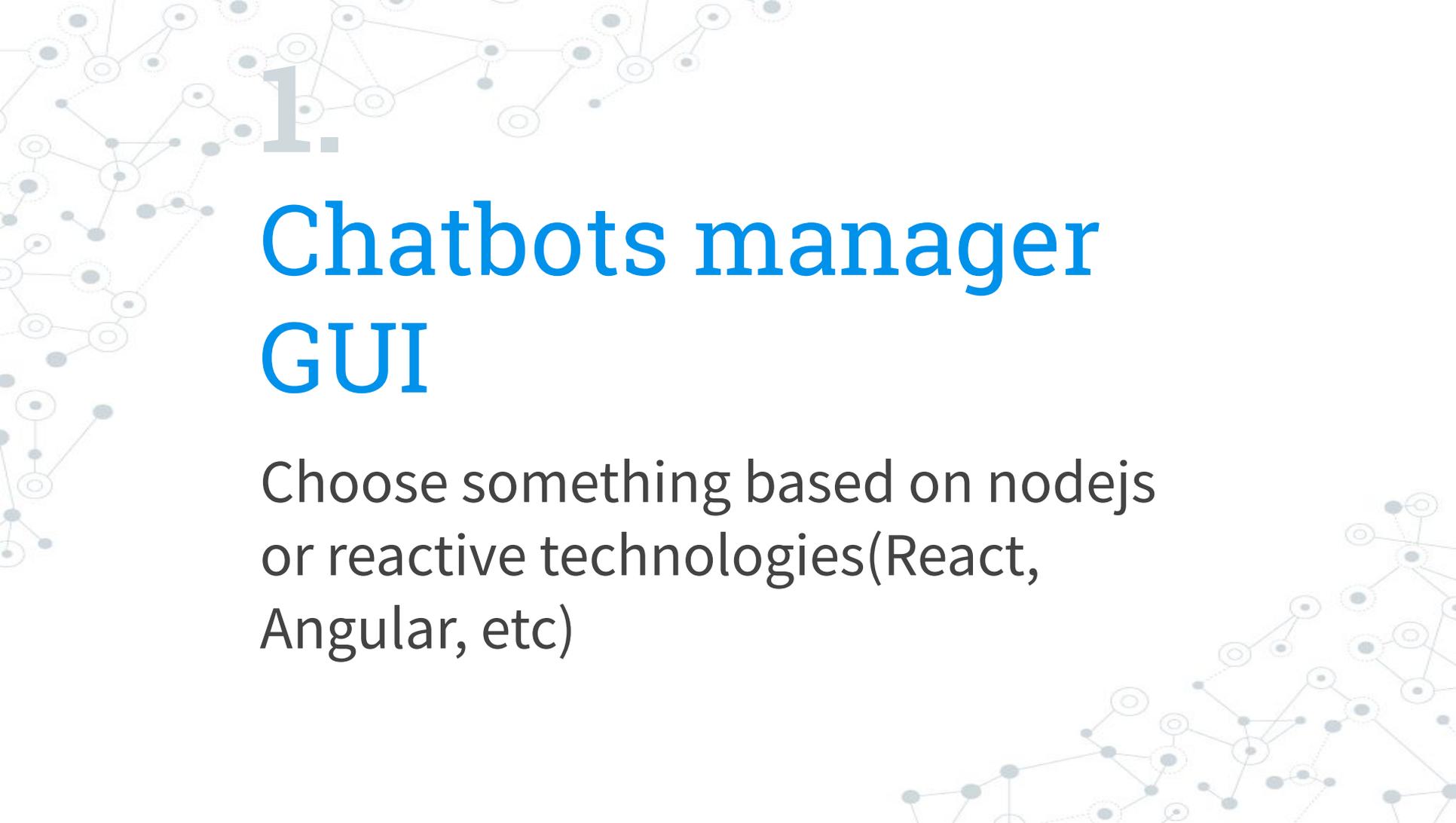
Serverless  
Chatbot  
deployment

3

Chatbot  
Logging and  
monitoring

4





1.

# Chatbots manager GUI

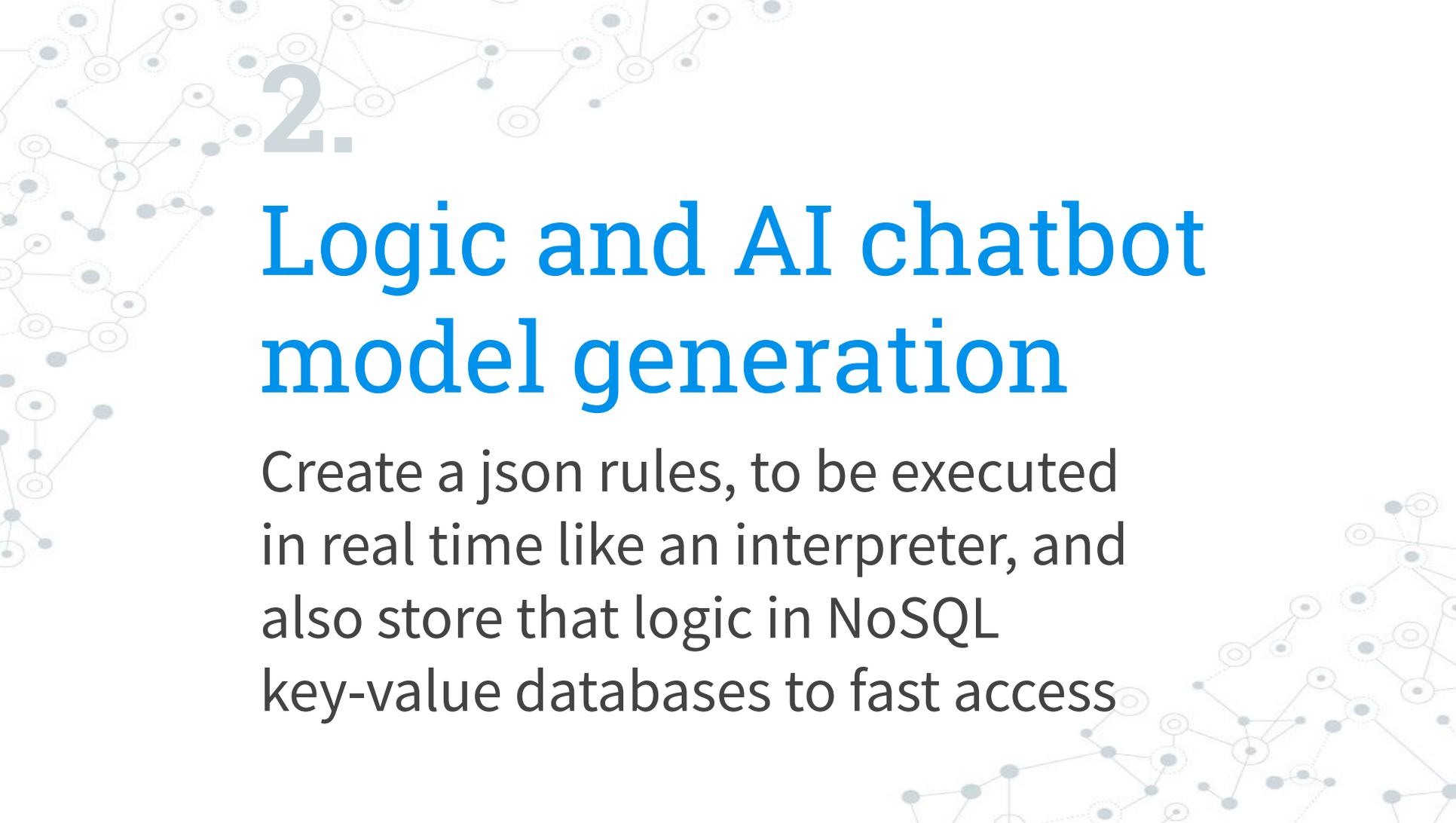
Choose something based on nodejs  
or reactive technologies(React,  
Angular, etc)

# Node.js

Executes javascript in the backend side, you can also develop frontend applications or real time applications

Ref. <https://nodejs.org>





2.

# Logic and AI chatbot model generation

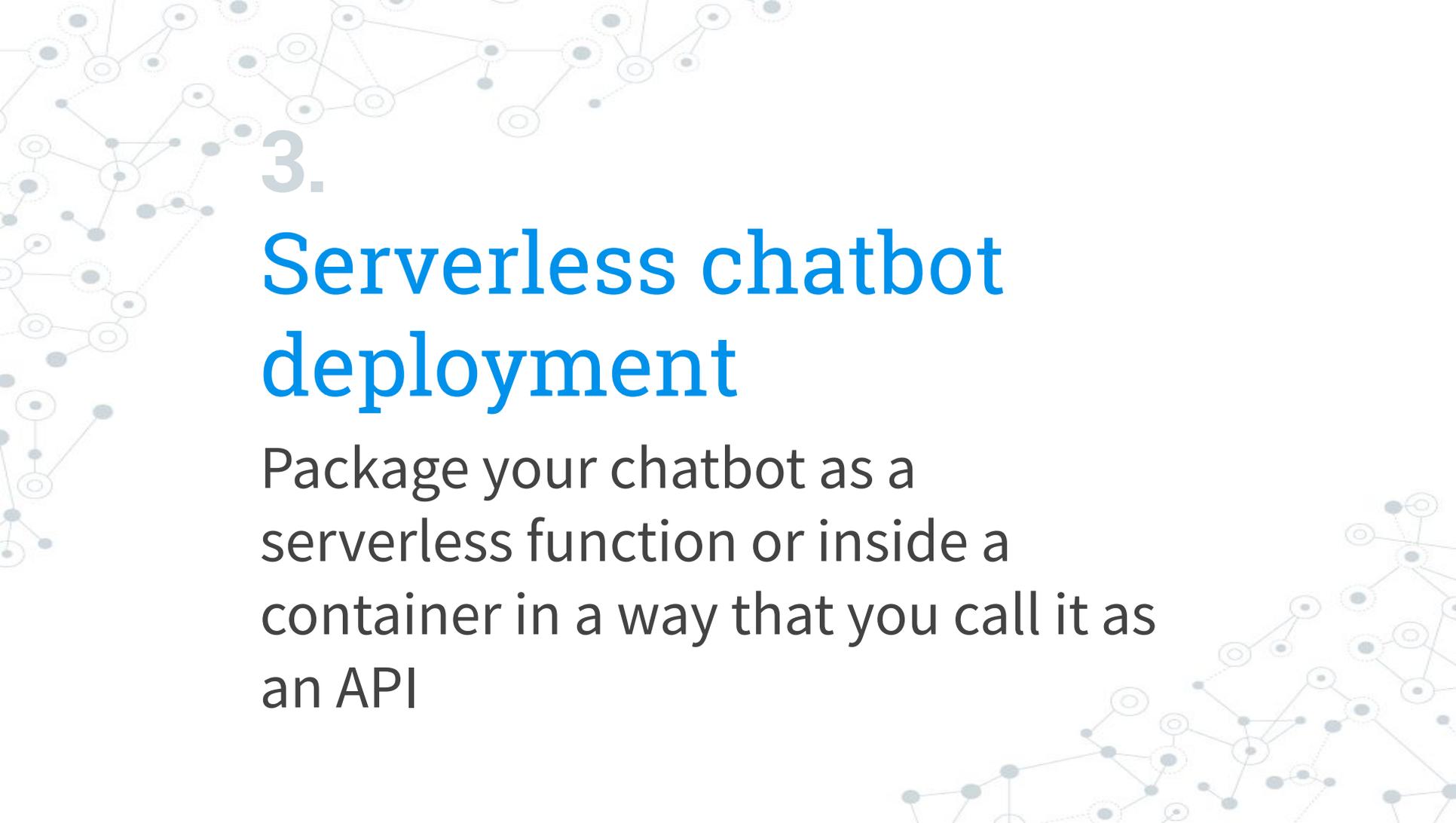
Create a json rules, to be executed in real time like an interpreter, and also store that logic in NoSQL key-value databases to fast access

# TensorFlow

AI framework to create  
an models using  
different techniques



Ref. <https://www.tensorflow.org/>



3.

## Serverless chatbot deployment

Package your chatbot as a serverless function or inside a container in a way that you call it as an API

# OpenFaaS

OpenFaaS provides an open source serverless abstraction layer, build on top of kubernetes cluster



Ref. <https://www.openfaas.com/>

# Kubernetes

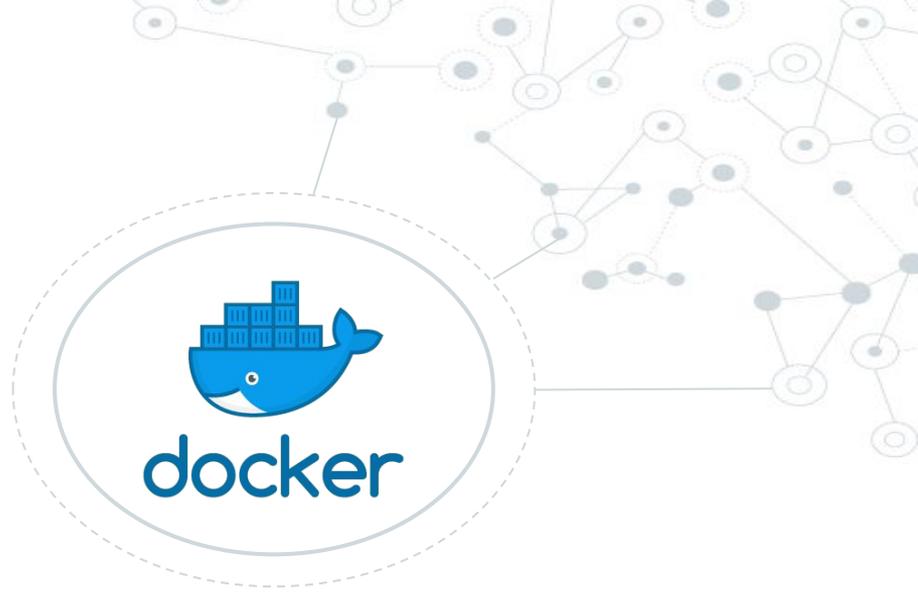
Kubernetes an orchestrator that manages all your Docker containers at big scale

Ref. <https://kubernetes.io/>



# Docker

Small kind of  
virtualization and a tool  
to develop  
microservices



Ref. <https://www.docker.com>  
<https://microservices.io>

# Rancher

GUI Panel to manage your K8s cluster in a fast and easy way, it also helps you to monitoring and implement CI/CD pipelines and DevOps best practices



Ref. <https://rancher.com>

# MySQL

A popular and powerful database to manage your chatbots data in a traditional way

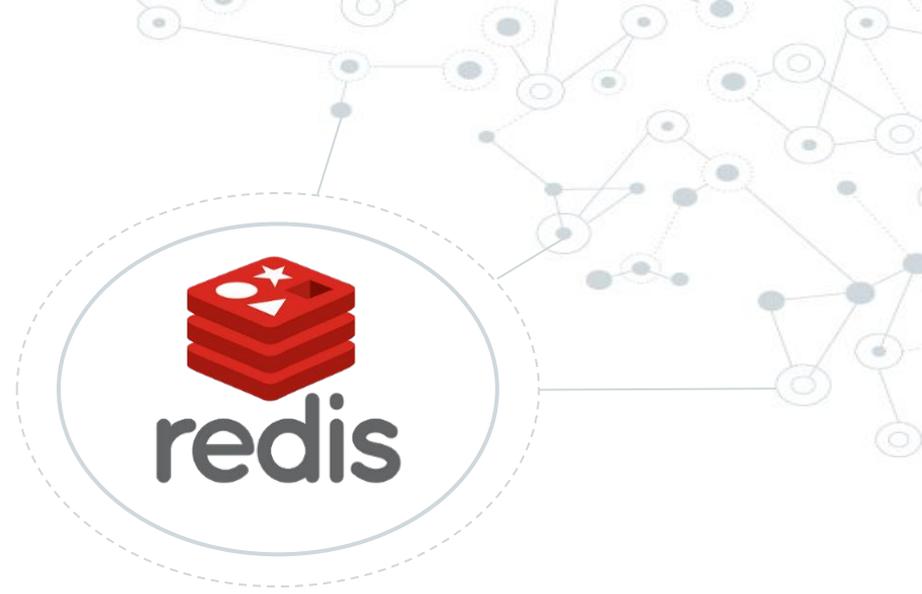


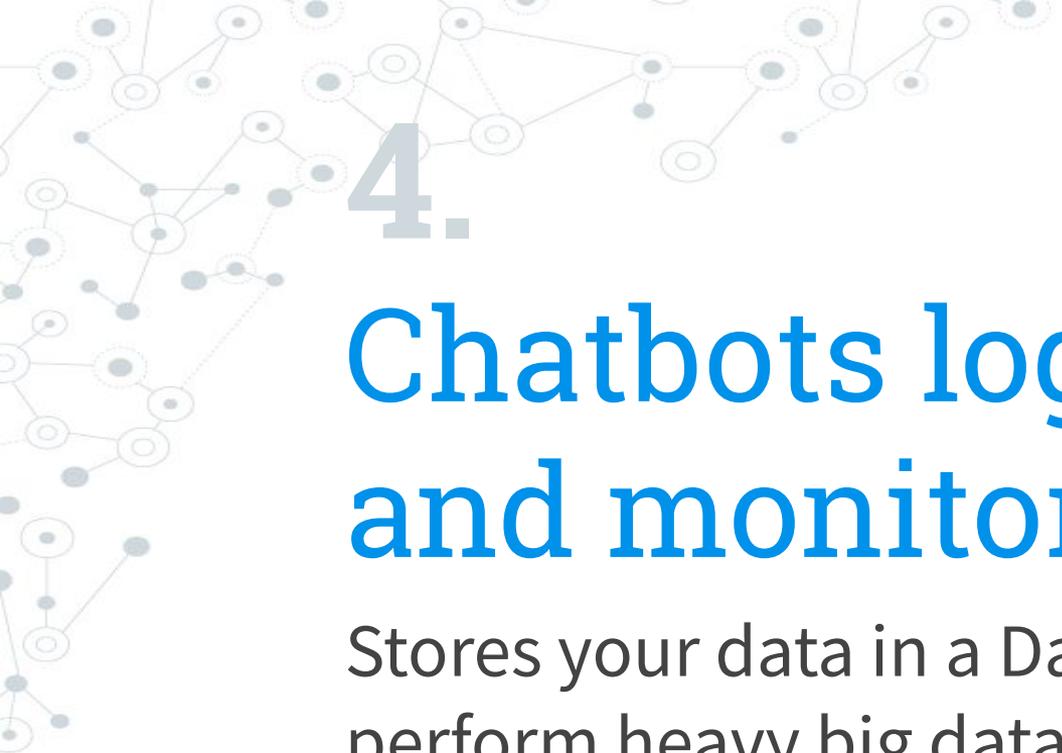
Ref. <https://www.mysql.com/>

# Redis

NoSQL key-value database,  
to store the chatbots logic,  
sessions, real time  
analytics, streams,  
searches, it also include  
geospatial data structures

Ref. <https://redis.io/>





4.

# Chatbots logging and monitoring

Stores your data in a Data lake,  
perform heavy big data analytics in  
background using broker  
technologies



# RabbitMQ

A broker to design  
stateless background  
heavy processes like  
data storage and  
analytics



Ref. <https://www.rabbitmq.com/>

# Prometheus

Monitor a specific part  
of your system, storage  
and do powerful  
queries with collected  
data



Ref. <https://prometheus.io/>

# Grafana

Easy data visualization  
for your system  
collected data

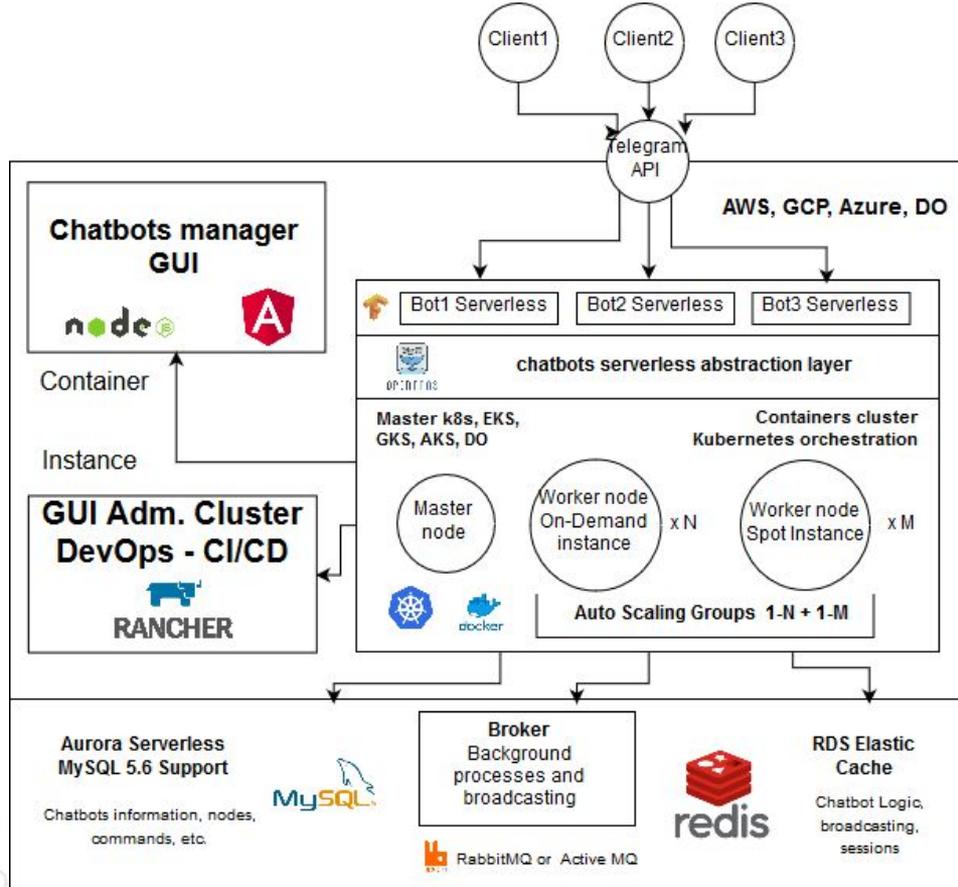


Ref. <https://grafana.com/>

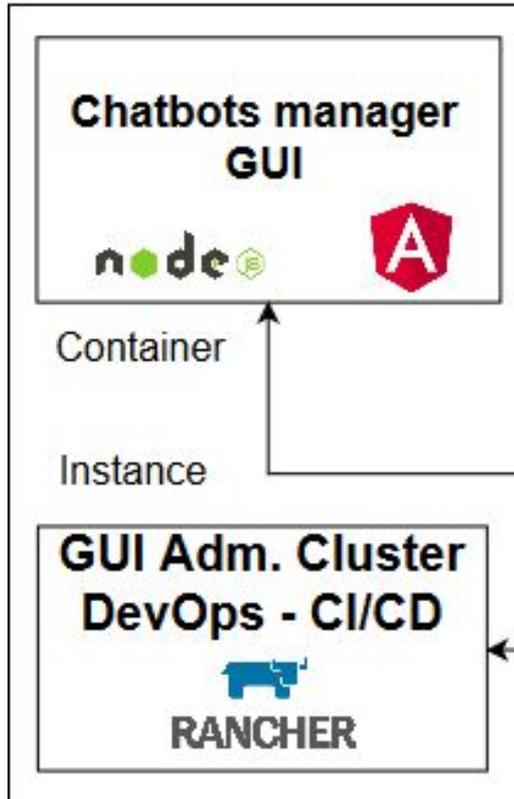
A decorative background featuring a network diagram of nodes and connections. The nodes are represented by circles of varying sizes and colors (gray, blue, and white with blue outlines). The connections are thin gray lines. The diagram is positioned in the corners of the page, with a larger concentration of nodes and connections in the bottom right corner and a smaller one in the top left corner.

# Architectures

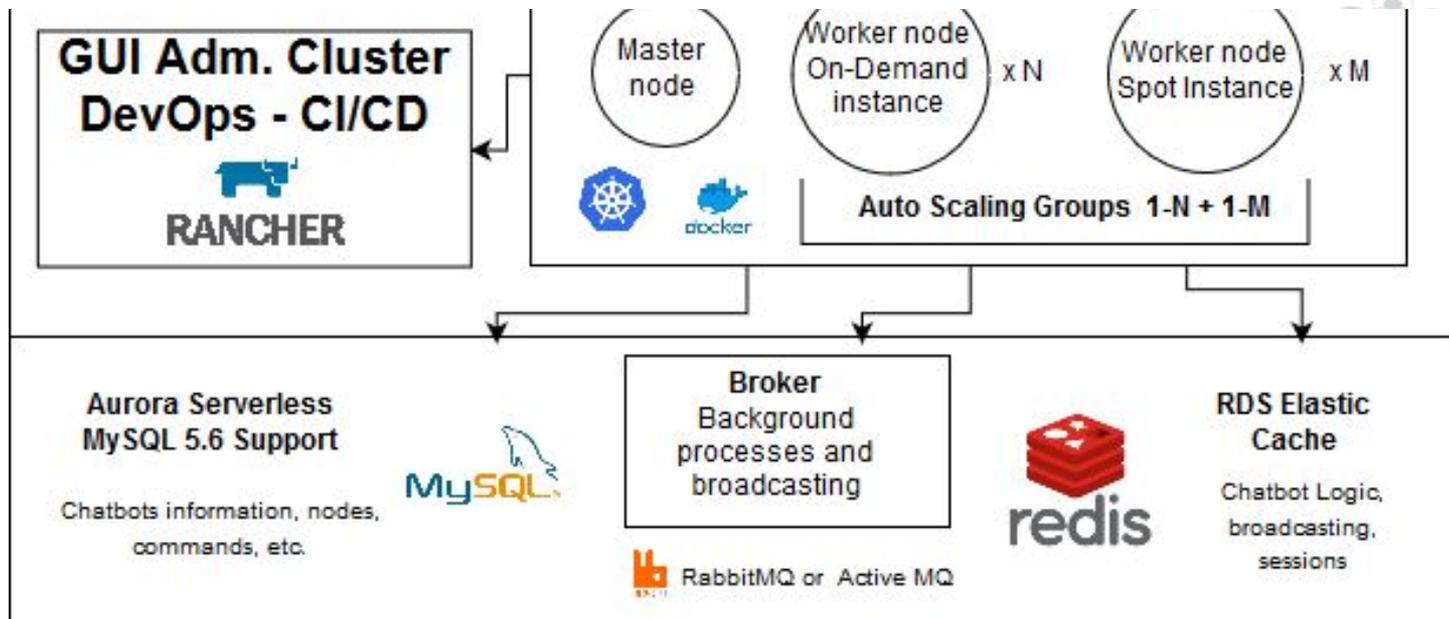
# Open Source Serverless Solution



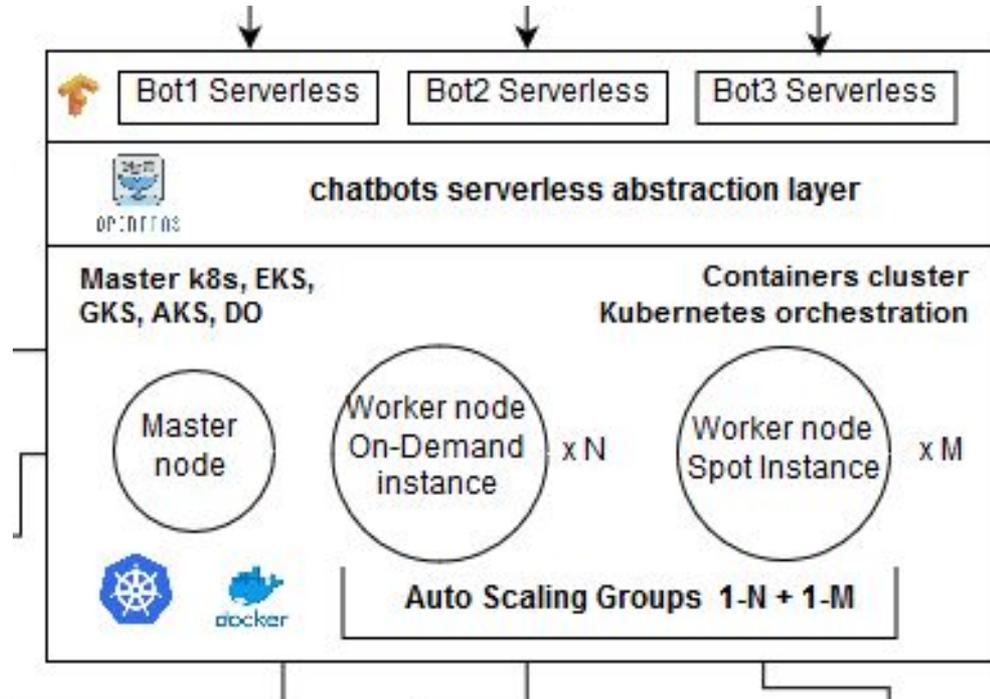
# Open Source Serverless Solution



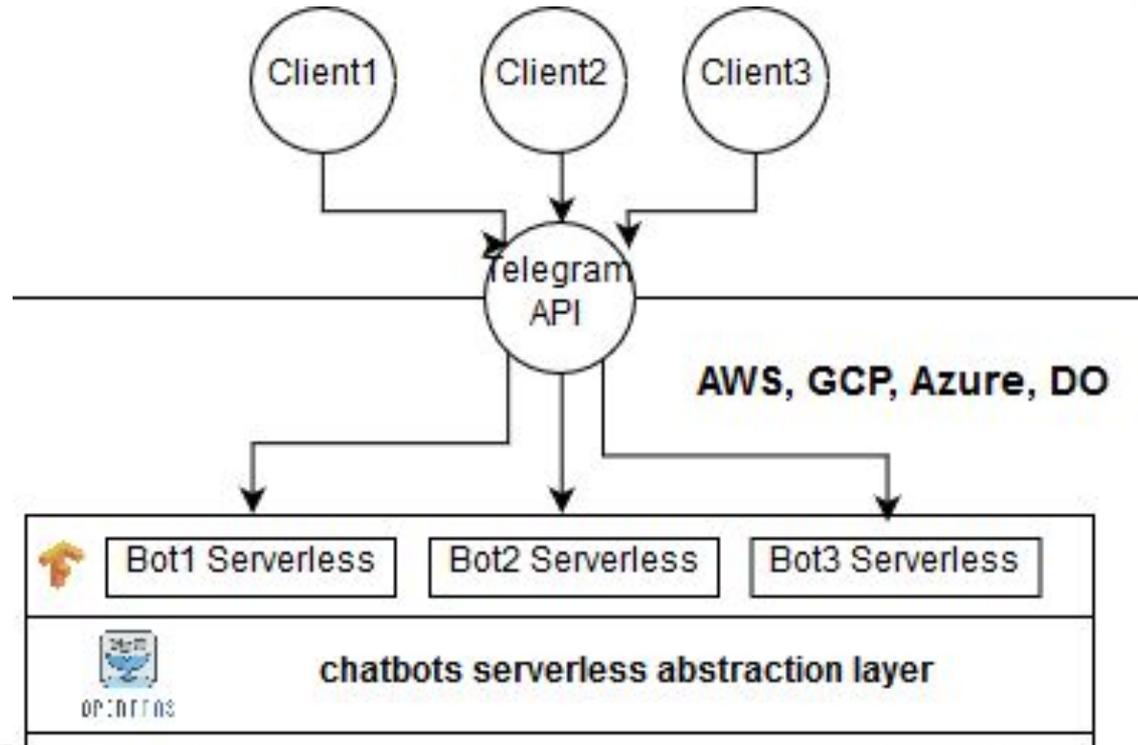
# Open Source Serverless Solution



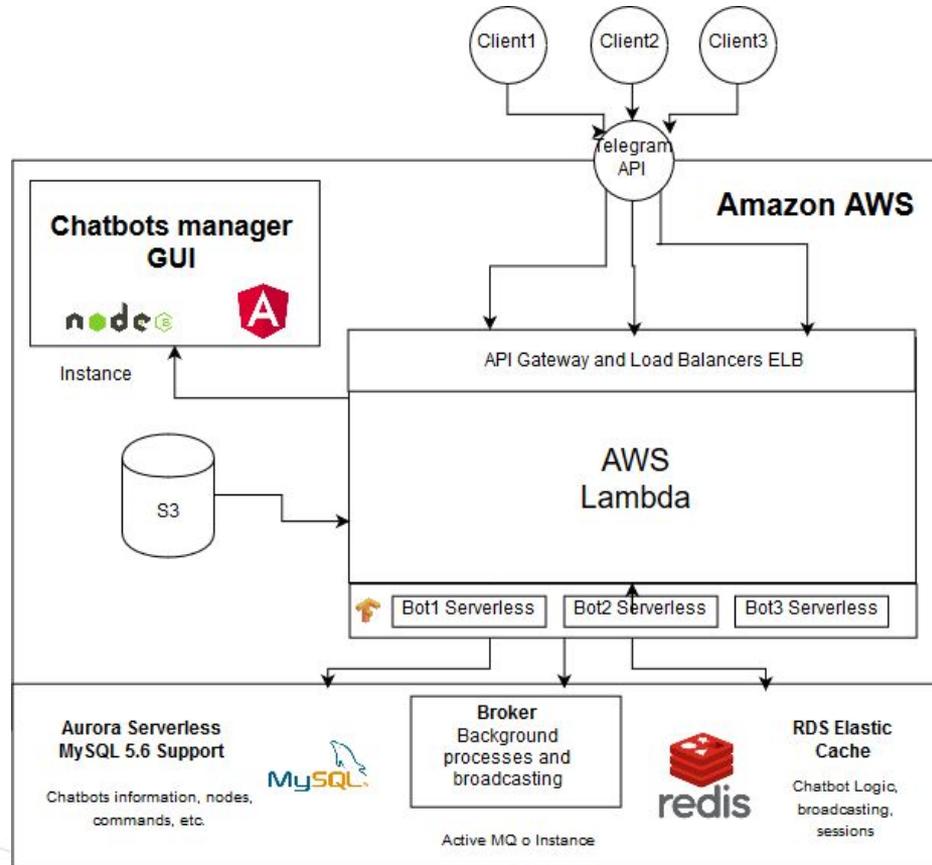
# Open Source Serverless Solution



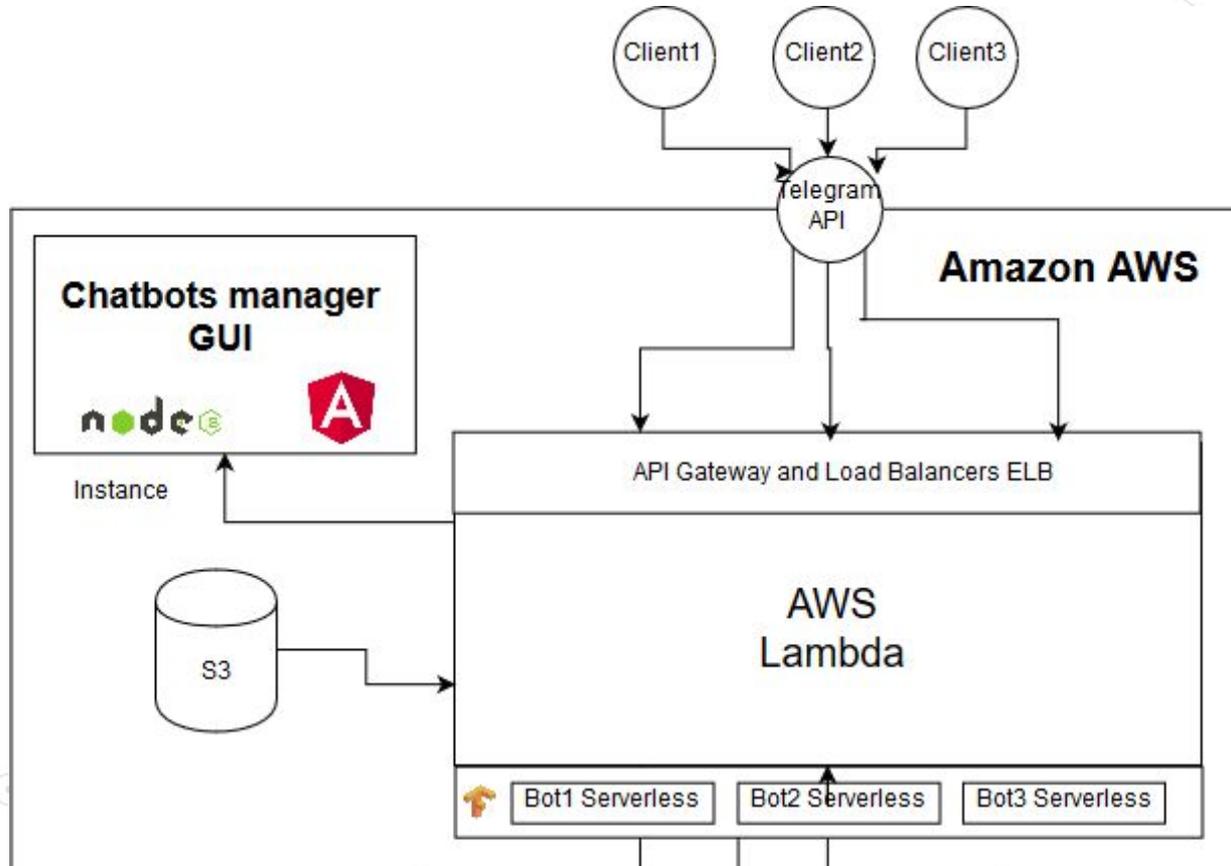
# Open Source Serverless Solution



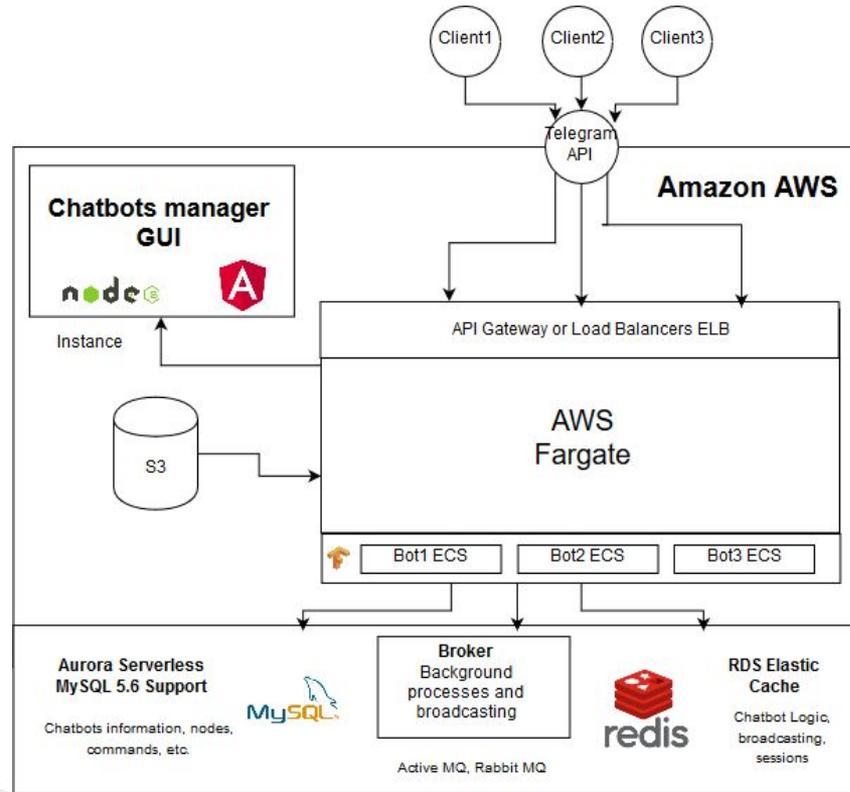
# Serverless Solution AWS Lambda



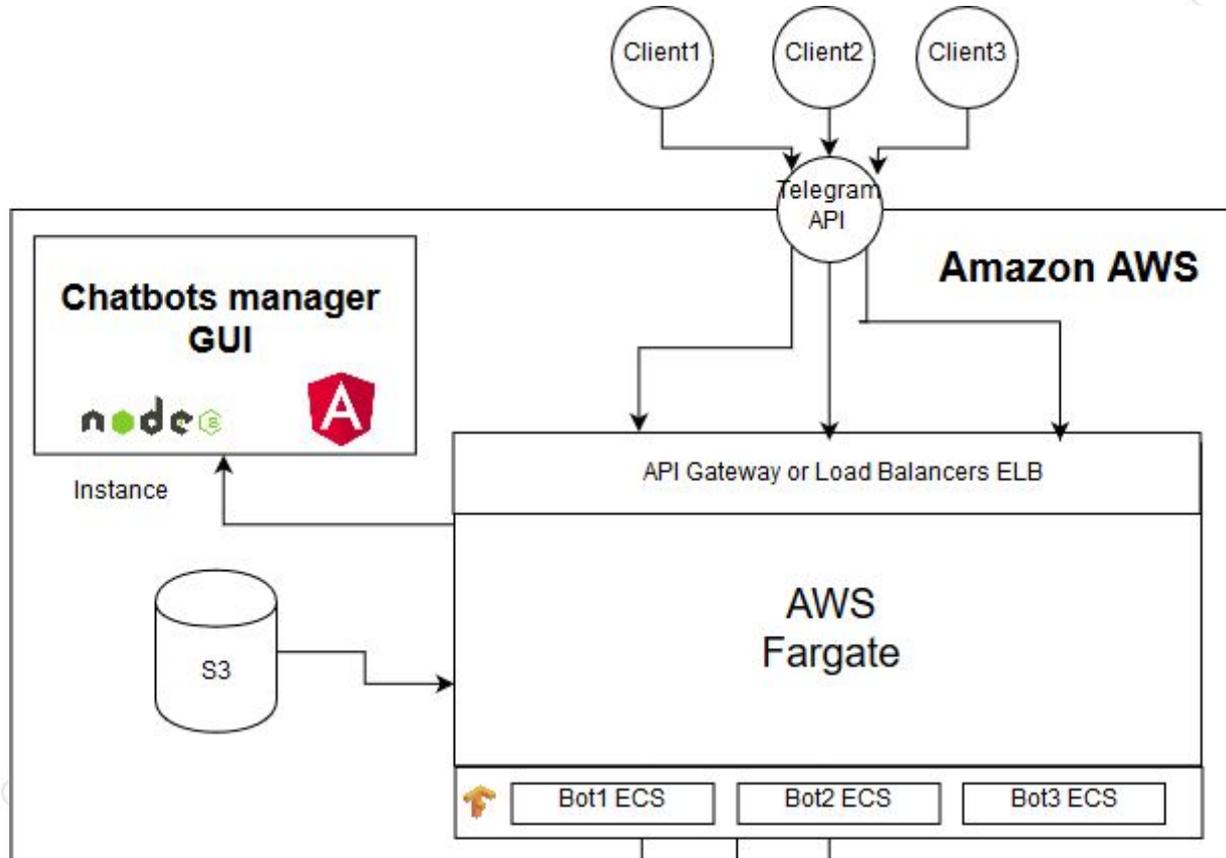
# Serverless Solution AWS Lambda



# Proprietary orchestrator solution AWS ECS/Fargate-EC2



# AWS ECS/Fargate-EC2





“

*The trend is to deploy some small parts of code as a functions on platform that is ready to run it, this is called **serverless** like **FaaS** or Function as a Service*



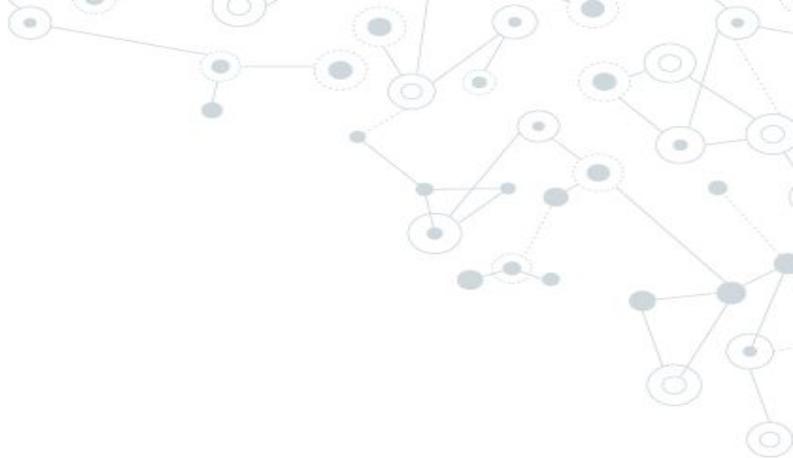
“

*Container orchestration and  
microservices architecture provides a fast  
way to build auto scalable, easy to  
upgrade and a modular systems, it also  
speed up your development time*



“

*The order of systems evolution are  
microservices, cloud native and  
serverless functions.*



# The goods and the bads

# The bads

- ◎ FaaS Open Source
  - Struggle with k8s management, scaling, monitoring, etc
- ◎ FaaS with a cloud provider
  - Limit on the time of work or job execution
  - Storage limits to deploy a function
  - Limited language and libraries support
- ◎ Managed orchestrator
  - Really expensive

# The goods

A decorative network diagram in the top right corner, consisting of various sized circles (nodes) connected by thin lines (edges). Some nodes are solid grey, while others are hollow white with a grey border. The connections form a complex, interconnected web.

- ◎ FaaS Open Source
    - You can optimize as most you want
    - Full customization
  - ◎ FaaS with a cloud provider
    - Cheapest
  - ◎ Managed orchestrator
    - Some level of customization
    - You don't waste time managing infrastructure
- 
- A decorative network diagram in the bottom left corner, similar to the one in the top right, featuring a mix of solid and hollow nodes connected by lines.

# DevOps with Open Source



## ◎ OpenFaaS

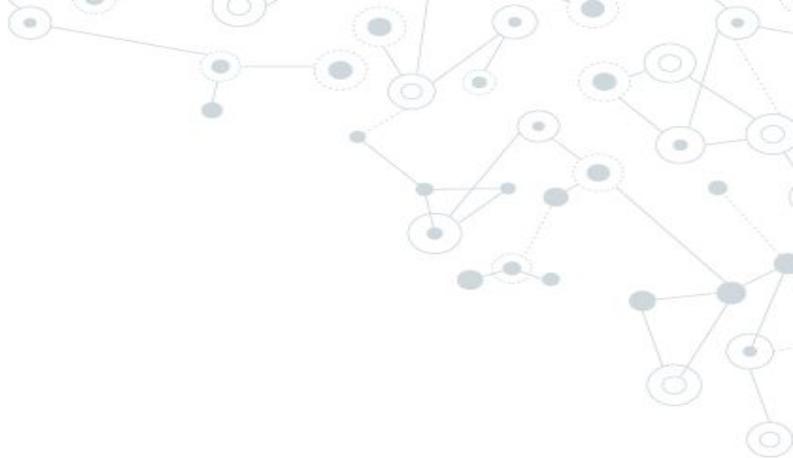
- Easy framework to create FaaS with no limits on top of k8s

## ◎ Rancher

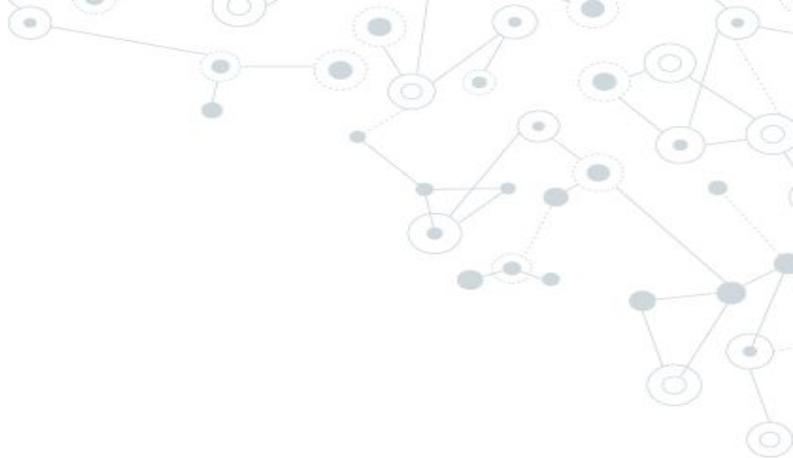
- Fastway to start using k8s and to implement CI/CD pipelines and DevOps best practices

## ◎ Docker and Kubernetes

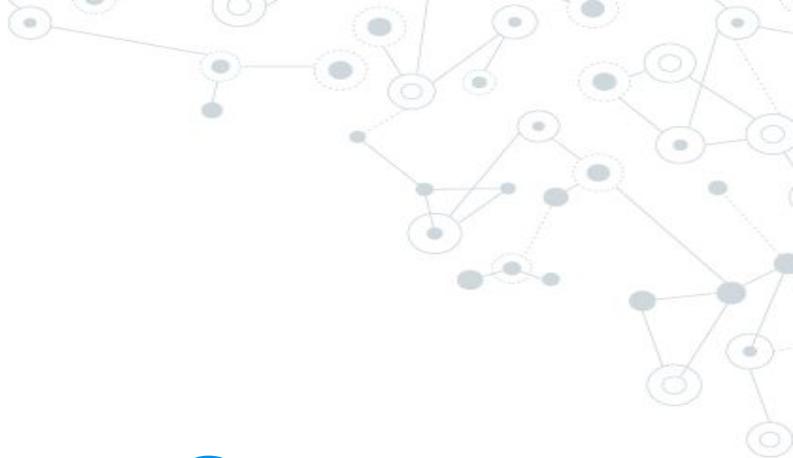
- The way to manage a large scale of containers cluster
- 



# Demo



Thanks



Questions?

# Rate today's session

## Cyberconflict: A new era of war, sabotage, and fear

See passes & pricing

David Sanger (The New York Times)  
9:55am-10:10am Wednesday, March 27, 2019  
Location: Ballroom  
Secondary topics: Security and Privacy

 Add to Your Schedule  
 Add Comment or Question

**Rate This Session**

We're living in a new era of constant sabotage, misinformation, and fear, in which everyone is a target, and you're often the collateral damage in a growing conflict among states. From crippling infrastructure to sowing discord and doubt, cyber is now the weapon of choice for democracies, dictators, and terrorists.

David Sanger explains how the rise of cyberweapons has transformed geopolitics like nothing since the invention of the atomic bomb. Moving from the White House Situation Room to the dens of Chinese, Russian, North Korean, and Iranian hackers to the boardrooms of Silicon Valley, David reveals a world coming face-to-face with the perils of technological revolution—a conflict that the United States helped start when it began using cyberweapons against Iranian nuclear plants and North Korean missile launches. But now we find ourselves in a conflict we're uncertain how to control, as our adversaries exploit vulnerabilities in our hyperconnected nation and we struggle to figure out how to deter these complex, short-of-war attacks.

### David Sanger

The New York Times

David E. Sanger is the national security correspondent for the New York Times as well as a national security and political contributor for CNN and a frequent guest on CBS *This Morning*, *Face the Nation*, and many PBS shows.



Session page on conference website

✓ Attending

Notes

Remove

Cyberconflict: A new era of war, sabotage, and fear

9:55 AM - 10:10 AM, Wed, Mar 27, 2019

### Speakers



David Sanger

National Security Correspondent  
The New York Times

📍 Ballroom

Keynotes

David Sanger explains how the rise of cyberweapons has transformed geopolitics like nothing since the invention of the atomic bomb. From crippling infrastructure to sowing discord and doubt, cyber is now the weapon of choice for democracies, dictators, and terrorists.

 SESSION EVALUATION

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