

Unlocking your serverless functions with OpenFaaS for AI chatbot projects

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About me



- © Operating Systems
Professor
- © DevOps Consulting
- © Curzona e-Learning
- © 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

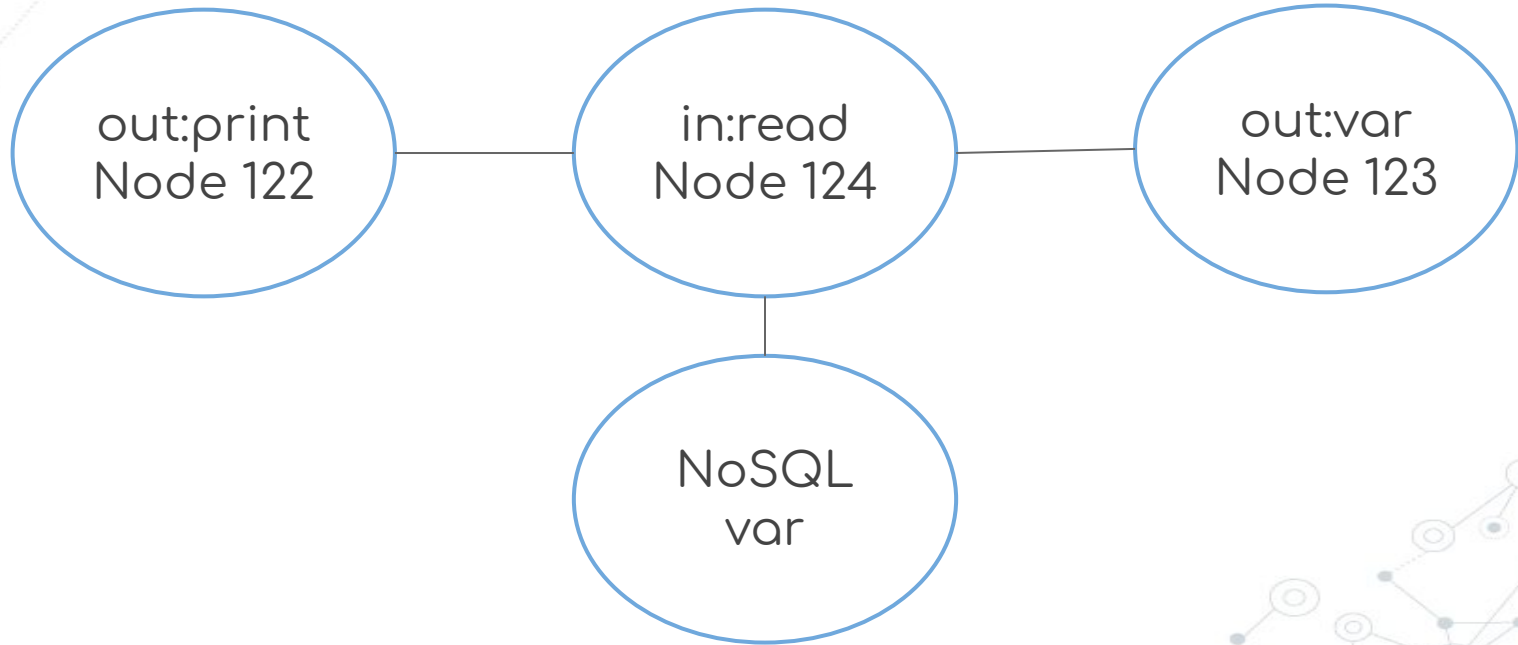
5

Set the Chatbot
Webhook with
your serverless
function

6

Monitoring
serverless
functions

Visual Programming

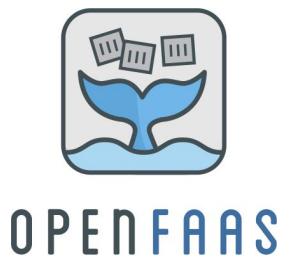
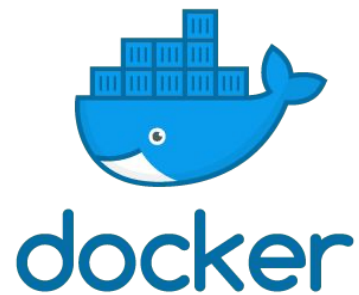


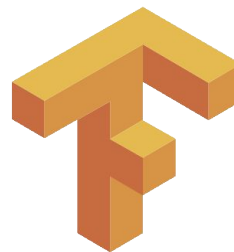
Language Example

```
{  
  "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"  
  }  
}
```




Open Source software
that you can use







The secret sauce

Container orchestrator

+

Serverless functions implementations

+

NoSQL Databases

+

Some monitoring and analytics

A decorative background featuring a network diagram. It consists of numerous nodes, represented by small circles, some of which are solid blue, some are grey with a blue outline, and others are grey with a blue outline and a central dot. These nodes are interconnected by thin, light grey lines, forming a complex web-like structure that is more dense on the left and right sides of the slide.

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/>



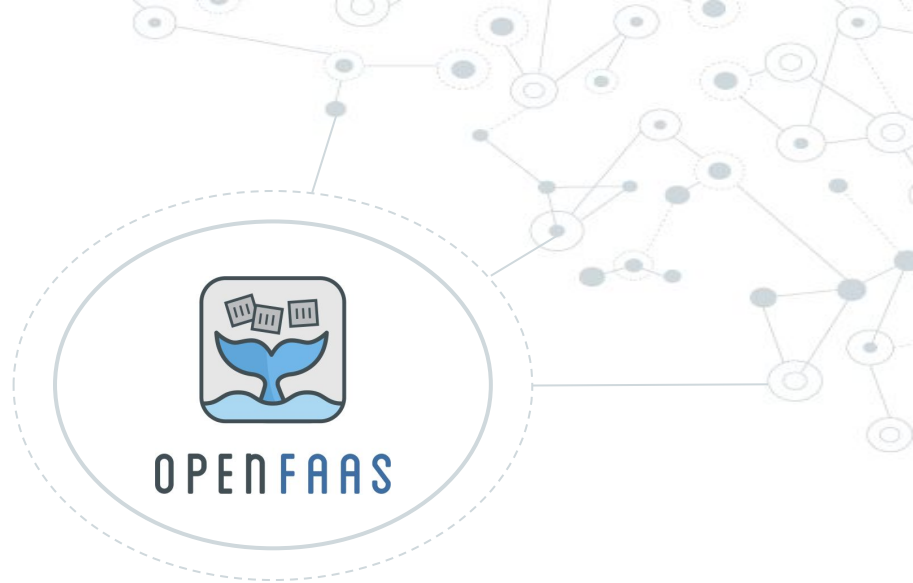
3.

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

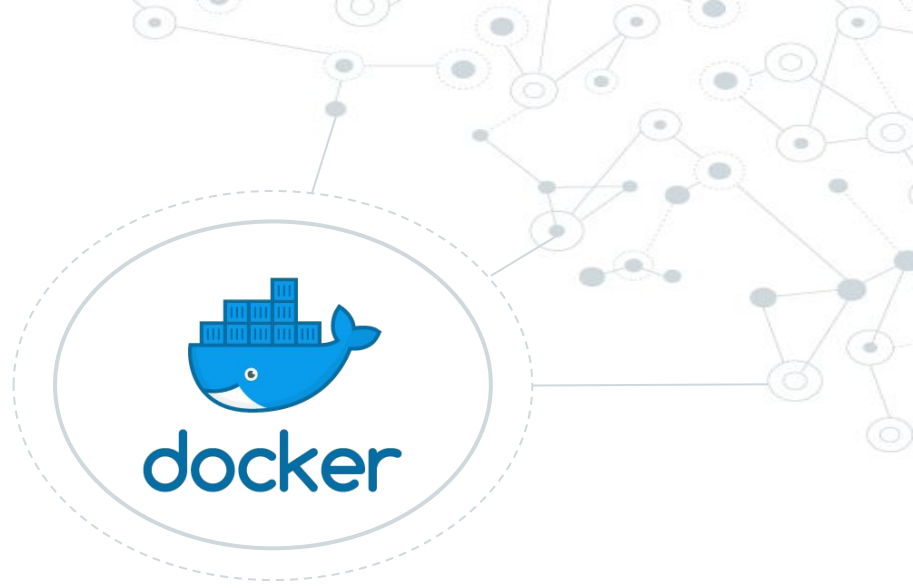
Kubernetes an
orchestrator that
manages all your
Docker containers at big
scale



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

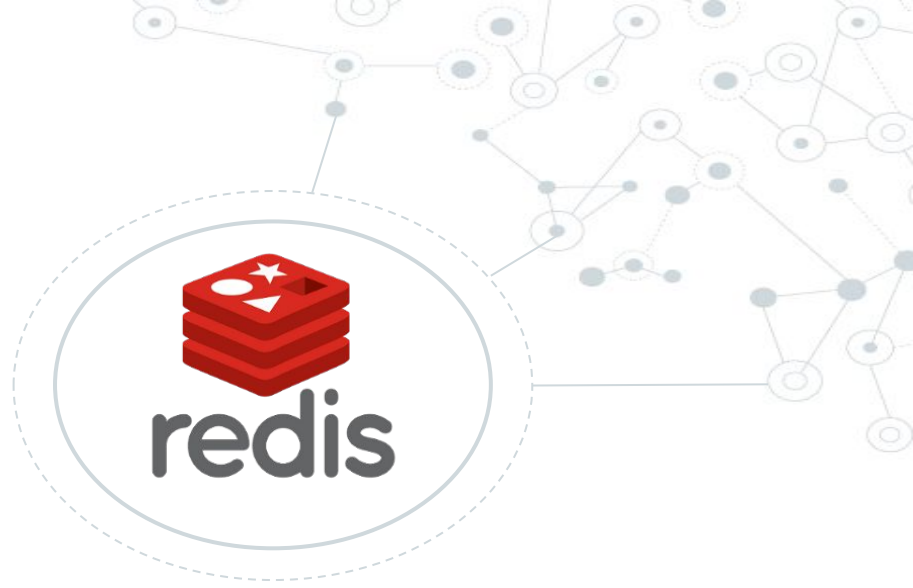
A popular and powerful
database to manage
your chatbots data in a
traditional way



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

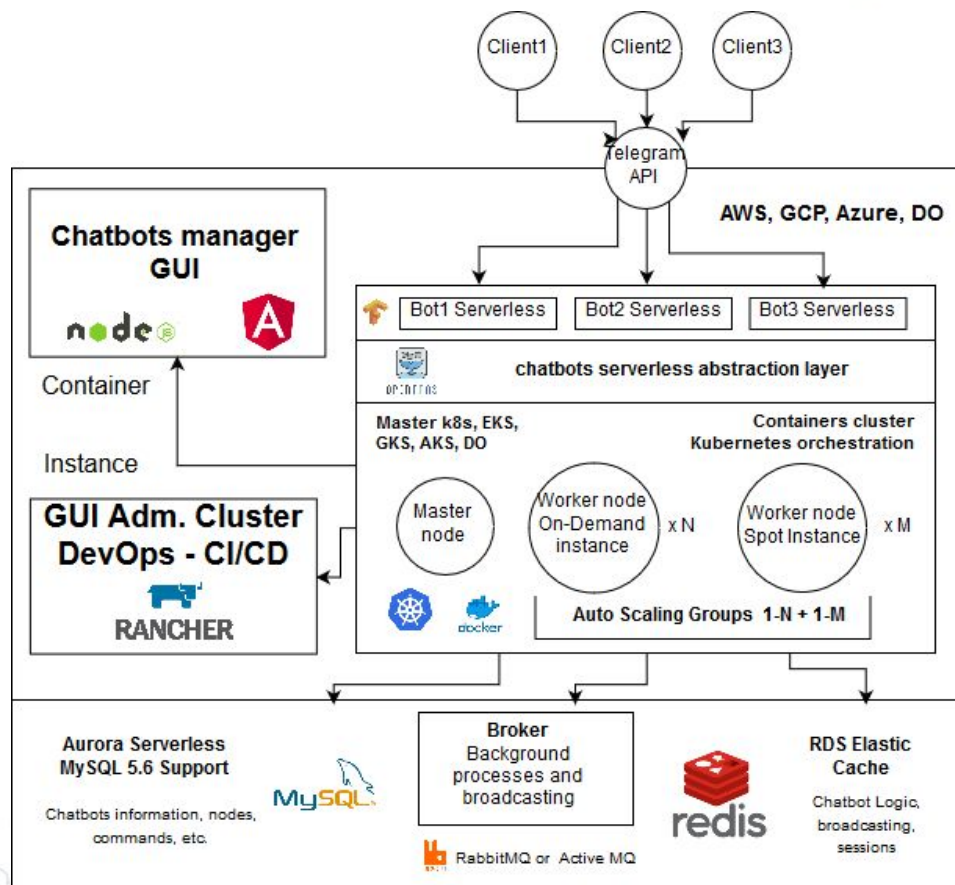


Ref. <https://grafana.com/>

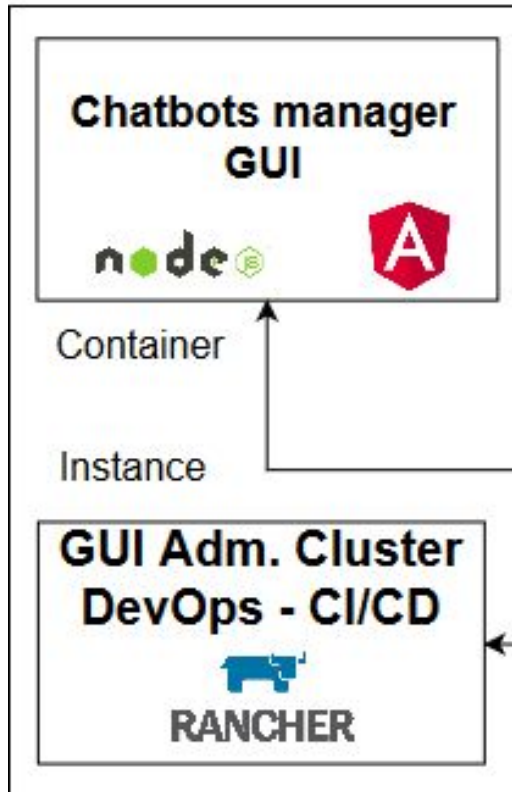
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Architectures

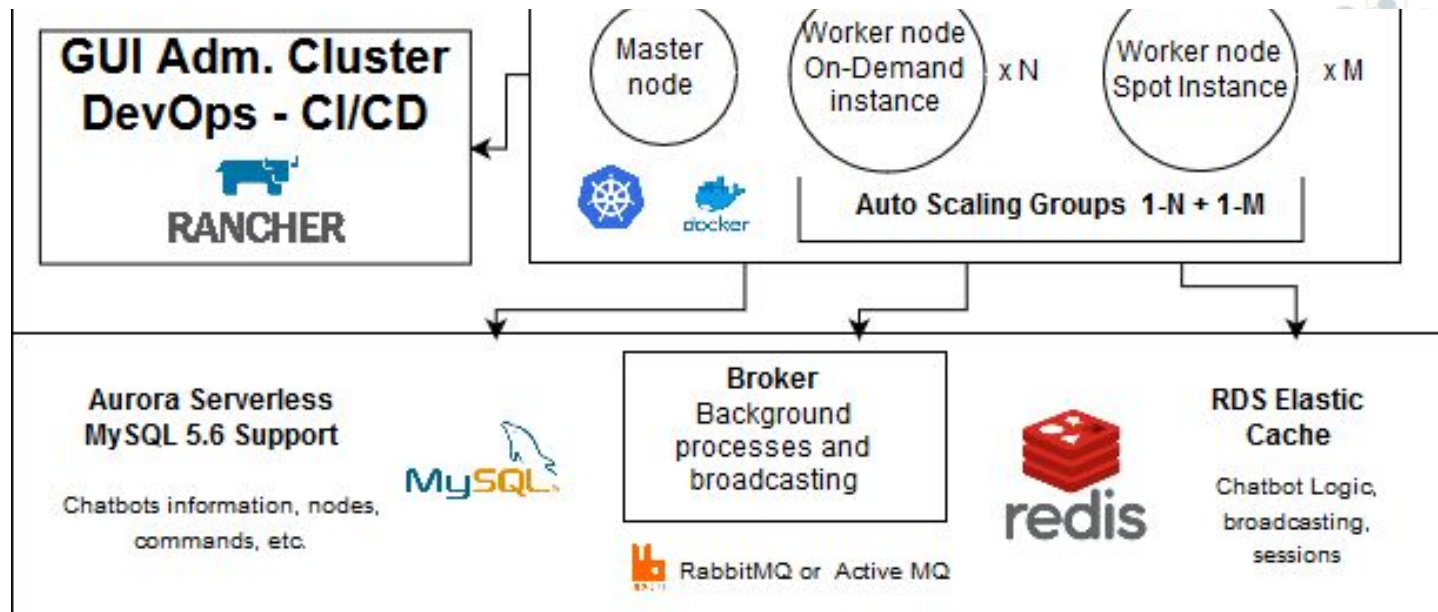
Open Source Serverless Solution



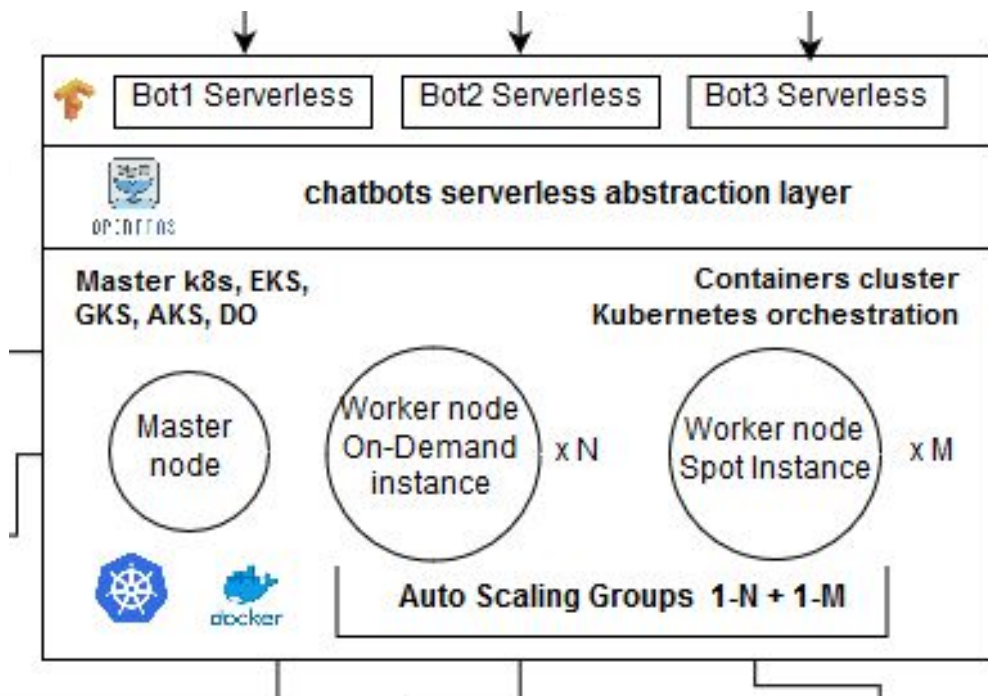
Open Source Serverless Solution



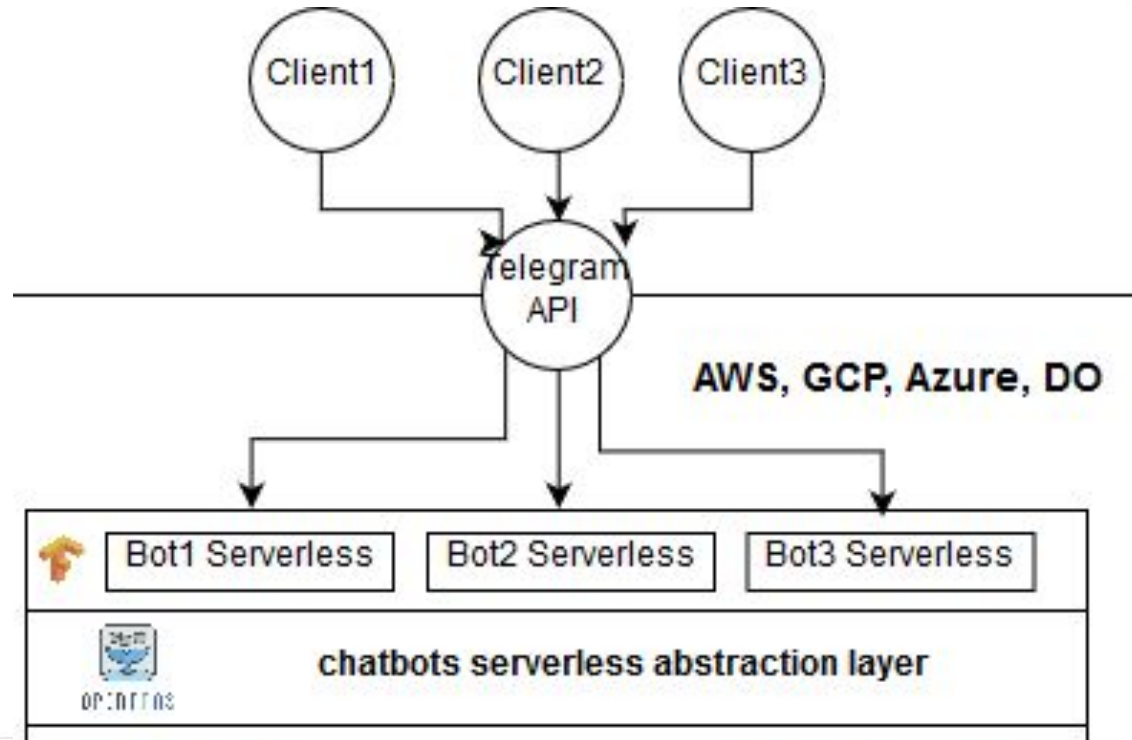
Open Source Serverless Solution



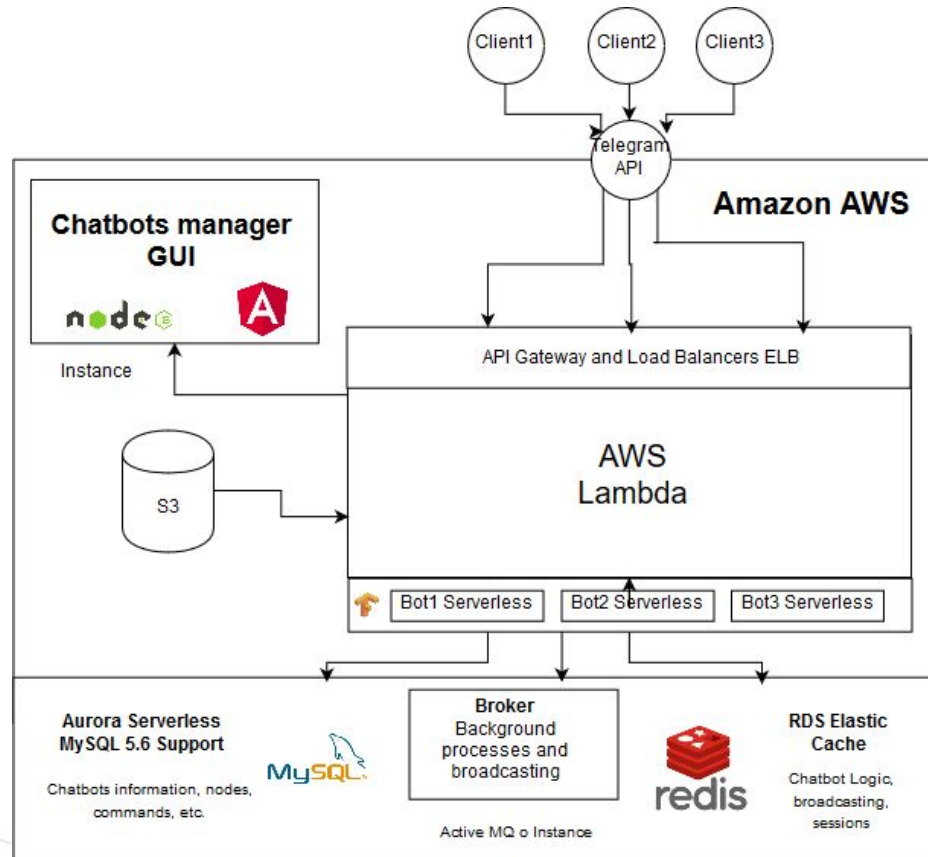
Open Source Serverless Solution



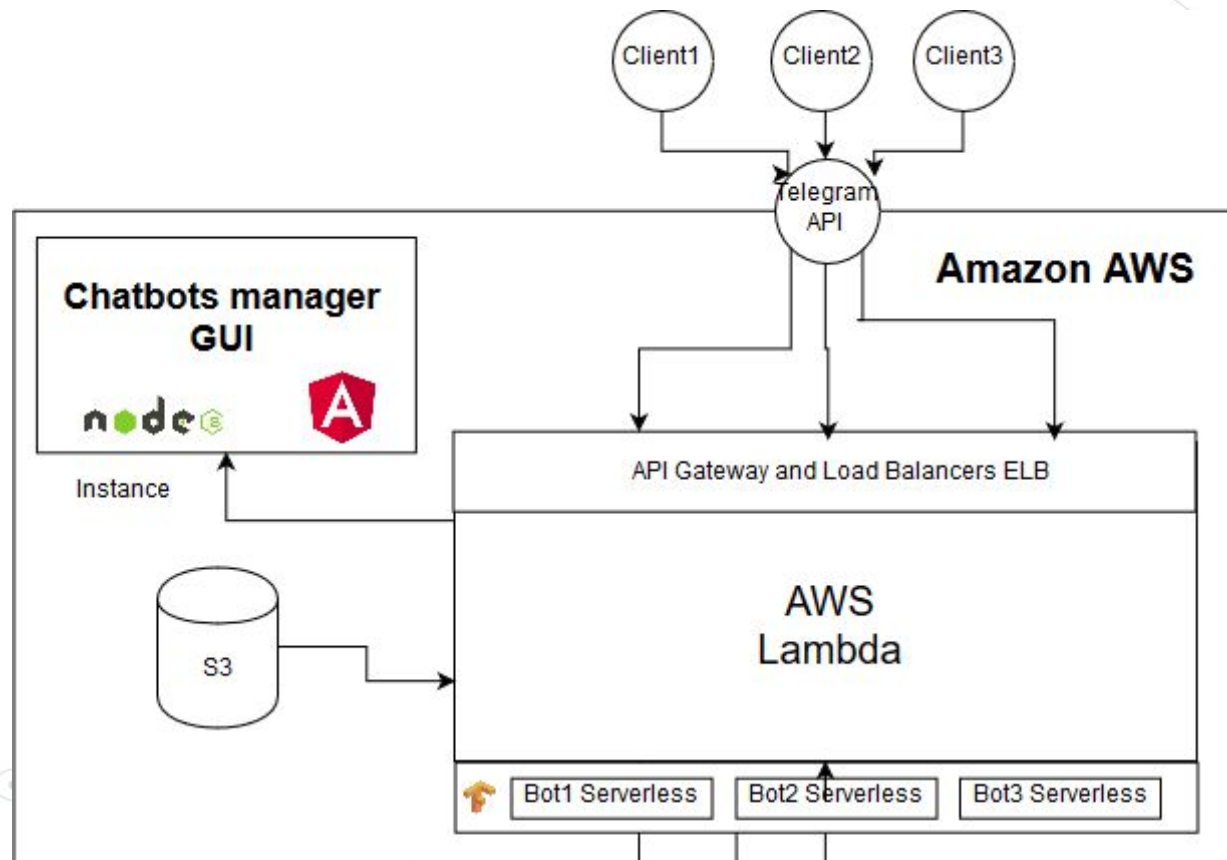
Open Source Serverless Solution



Serverless Solution AWS Lambda

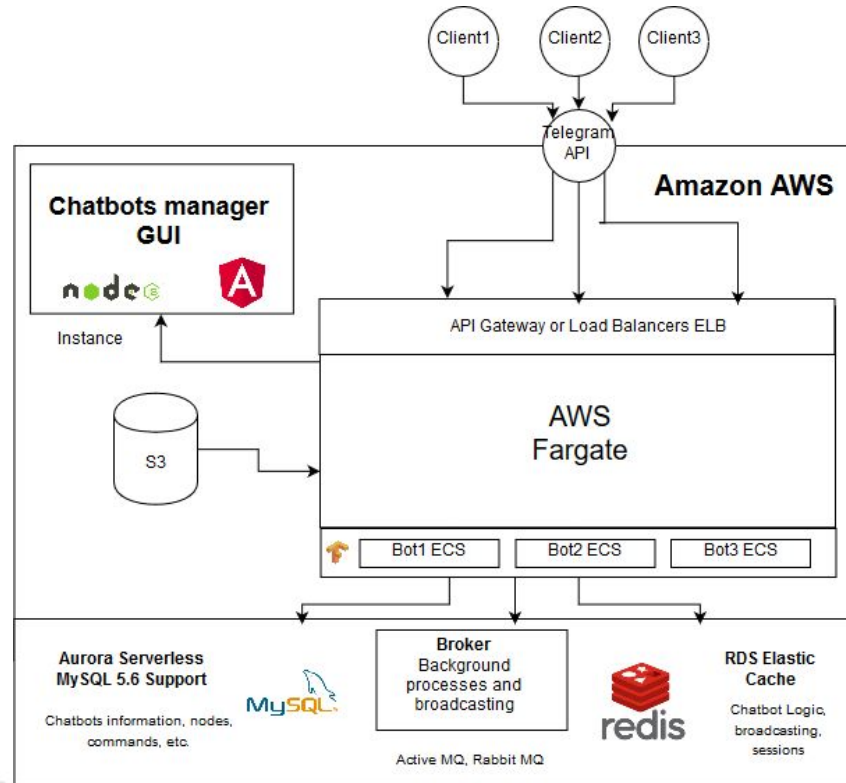


Serverless Solution AWS Lambda

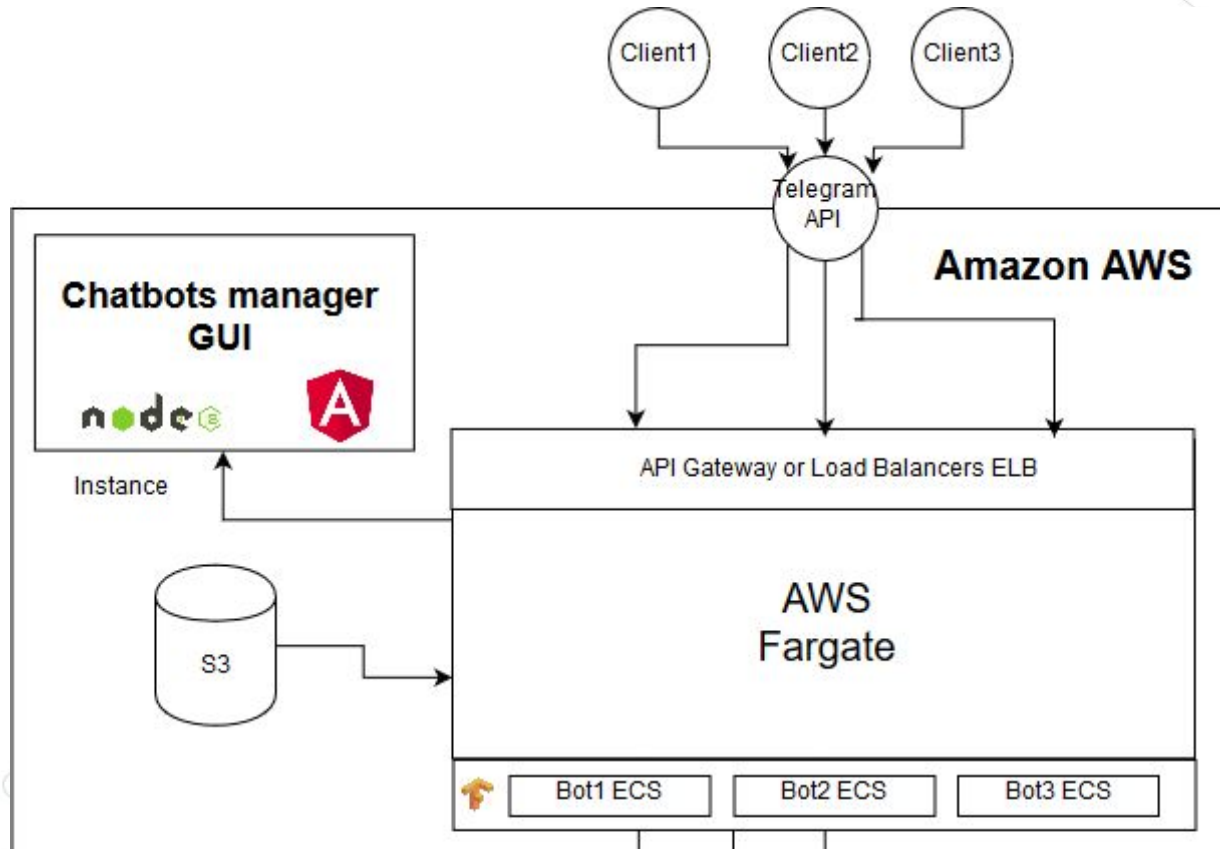


Proprietary orchestrator solution

AWS ECS/Fargate-EC2



AWS ECS/Fargate-EC2



A decorative network diagram at the top of the slide, featuring a complex web of interconnected nodes and lines. A central node is highlighted with a dashed circle and a solid circle, containing a large blue double quote symbol.

“

*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*

A decorative network diagram at the top of the slide, featuring a complex web of interconnected nodes and lines. The nodes are represented by small circles, some solid and some hollow, connected by thin lines. A central node is highlighted with a dashed oval and a blue double quote symbol.

“

*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*

A decorative network diagram at the top of the slide, featuring a complex web of interconnected nodes and lines. A central node is highlighted with a dashed circle and a solid circle, containing a large blue double quote symbol.

“

*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

© 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

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

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

Secondary topics: Security and Privacy

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.



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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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