



Qualification and industrialisation of an API Gateway solution

End-of-study oral presentation



INSTITUT MÉDITERRANÉEN
D'ÉTUDES ET DE RECHERCHE EN
INFORMATIQUE ET ROBOTIQUE

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Plan

- La Française Des Jeux
- Tech-Lab
- La mission
- Méthodologie de projet
- Proof Of Concept
- Conclusion

La Française Des Jeux

History



Lottery & gambling industry

	Competing activities	Monopoly activities
Physical retail		
Online		

Lottery & gambling industry

Competing activities



Monopoly activities



Lottery & gambling industry

Competing activities



Monopoly activities



Lottery & gambling industry

Competing activities



Monopoly activities



Lottery & gambling industry

	Competing activities	Monopoly activities
Physical point of sale	Nothing.	Everything.
WWW		

Lottery & gambling industry

	Competing activities	Monopoly activities
Point de vente	Nothing.	Everything.
WWW		SOLITAIRE MON TICKET POUR PARIS 2024 ASTRO GOAL!

Lottery & gambling industry

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WWW		

Lottery & gambling industry

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WWW		Pure hasard.

Lottery & gambling industry

	Competing activities	Monopoly activities
Point de vente	Nothing.	Everything.
WWW	PARIONS SPORT POKER	Pure hasard.
PARIONS SPORT EN LIGNE		

Lottery & gambling industry

	Competing activities	Monopoly activities
Point de vente	Nothing.	Everything.
WWW	Anything else.	Pure hasard.

4.9M

logged in active clients

150K

simultaneous users sessions

30,000+

point of sale in France

25M

players

360

authentication per second

2.4M

inscription per year

Tech-Lab

Introduction

The need ...

*Qualify and industrialize emerging
technological solutions to facilitate their
use*

*Qualifier et industrialiser des solutions
technologiques émergentes pour faciliter
leur utilisation*

Introduction

Qualify and industrialize emerging technological solutions to facilitate their use

Qualifier et industrialiser des solutions technologiques émergentes pour faciliter leur utilisation



The need ...

have a **transverse** character to the company / group ?

Introduction

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is **technical** and **not already addressed** by another entity ?

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is not a **prerequisite** for a business **roadmap** project ?

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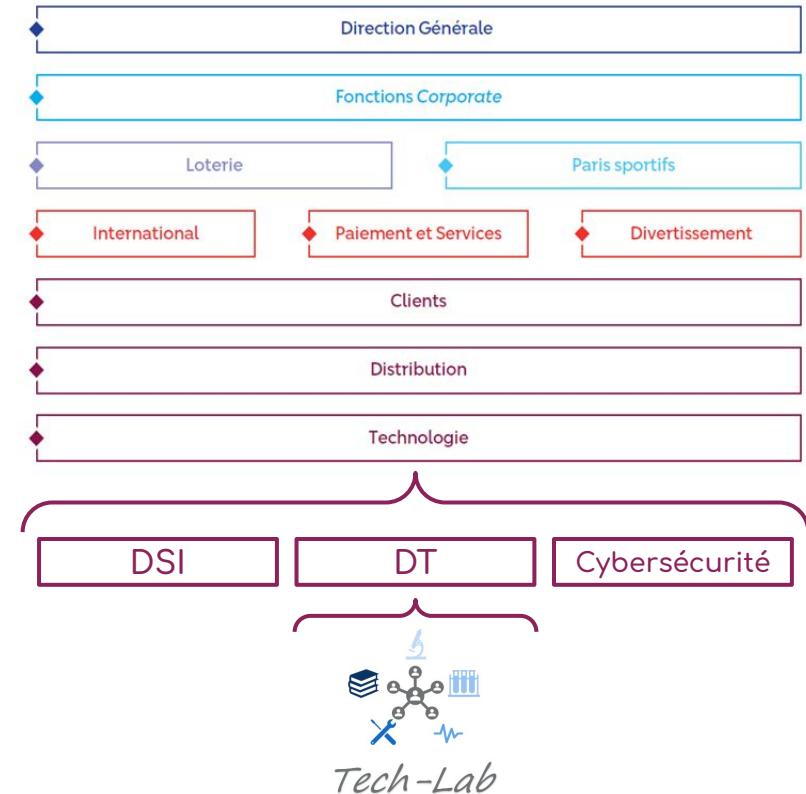
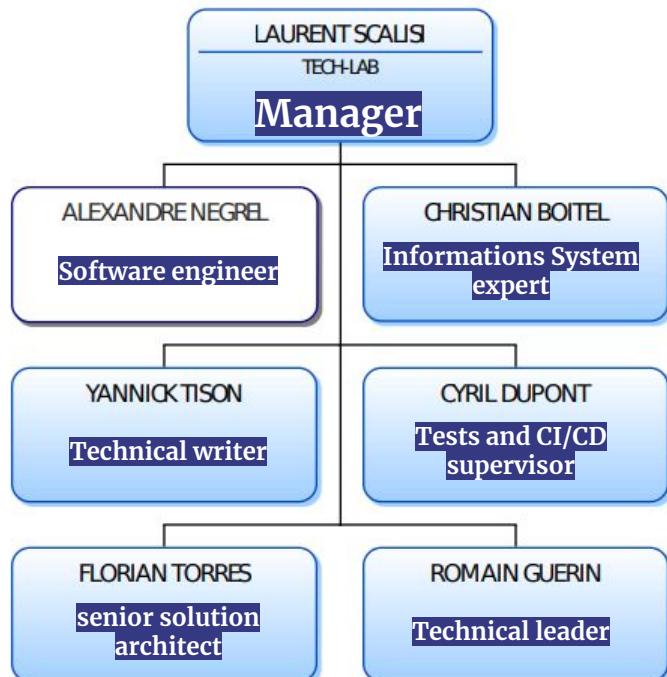


is not a **prerequisite** for a business **roadmap** project ?



doesn't concern a **business** product ?

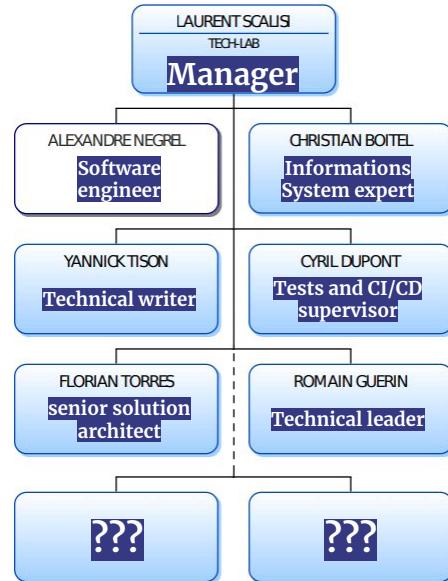
Organization



Governance

The need ...

- ✓ ...
- ✓ ...
- ✓ ...
- ✓ ...



Receiving entity

Board

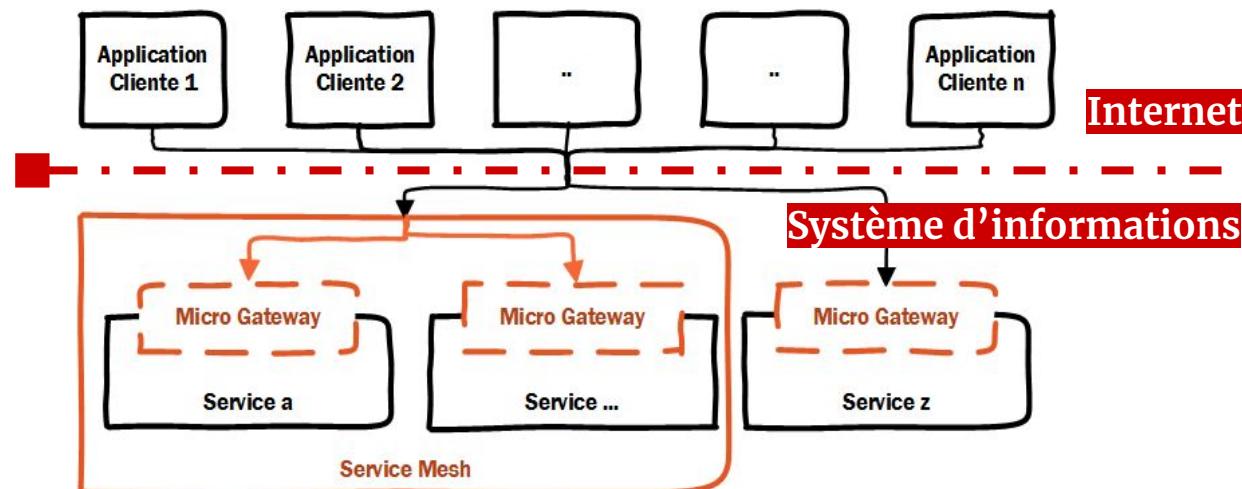
Identified subjects

Topic	Applicant	Maturity	Priority	Status
API-Gateway	U&A	★★★★	-	closed
Identity Provider	U&A	★★★★	1	in progress
APM/UPM	FGS/Tech-Lab	★★★★	2	board approval
DCC	U&A	★	3	
Distributed Tracing	U&A	★	TBD	
Block Chain	DT	★	TBD	

La mission

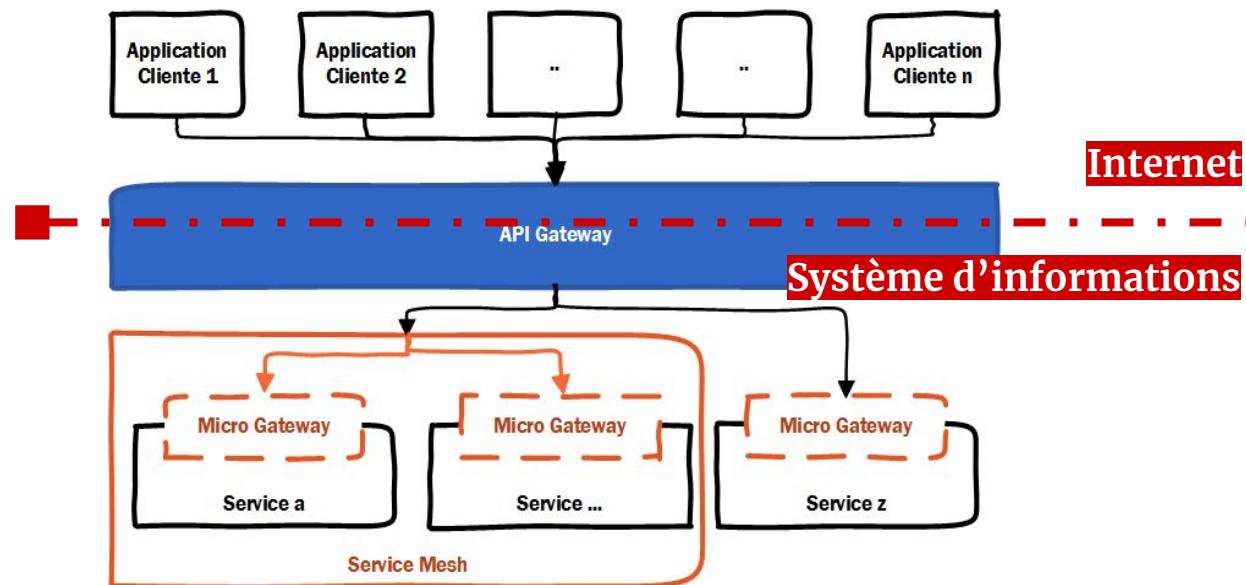
Le besoin

- Gérer les points d'accès définis dans le contrat
- Contrôler la conformité des appels
- Localiser les services
- Router vers les services
- Protéger les services

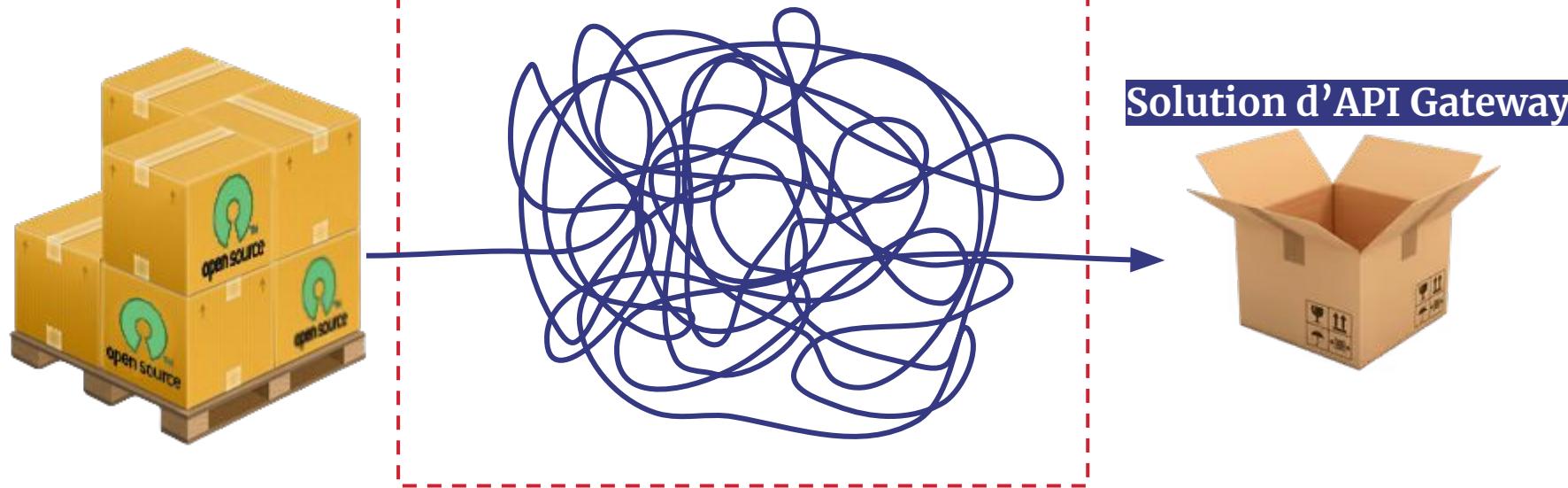


Le besoin

- Gérer les points d'accès définis dans le contrat
- Contrôler la conformité des appels
- Localiser les services
- Router vers les services
- Protéger les services



L'objectif



Les contraintes



Standard

- Satisfaire le besoin fonctionnel
- Performance
- Observabilité

Industrie des jeux d'argent

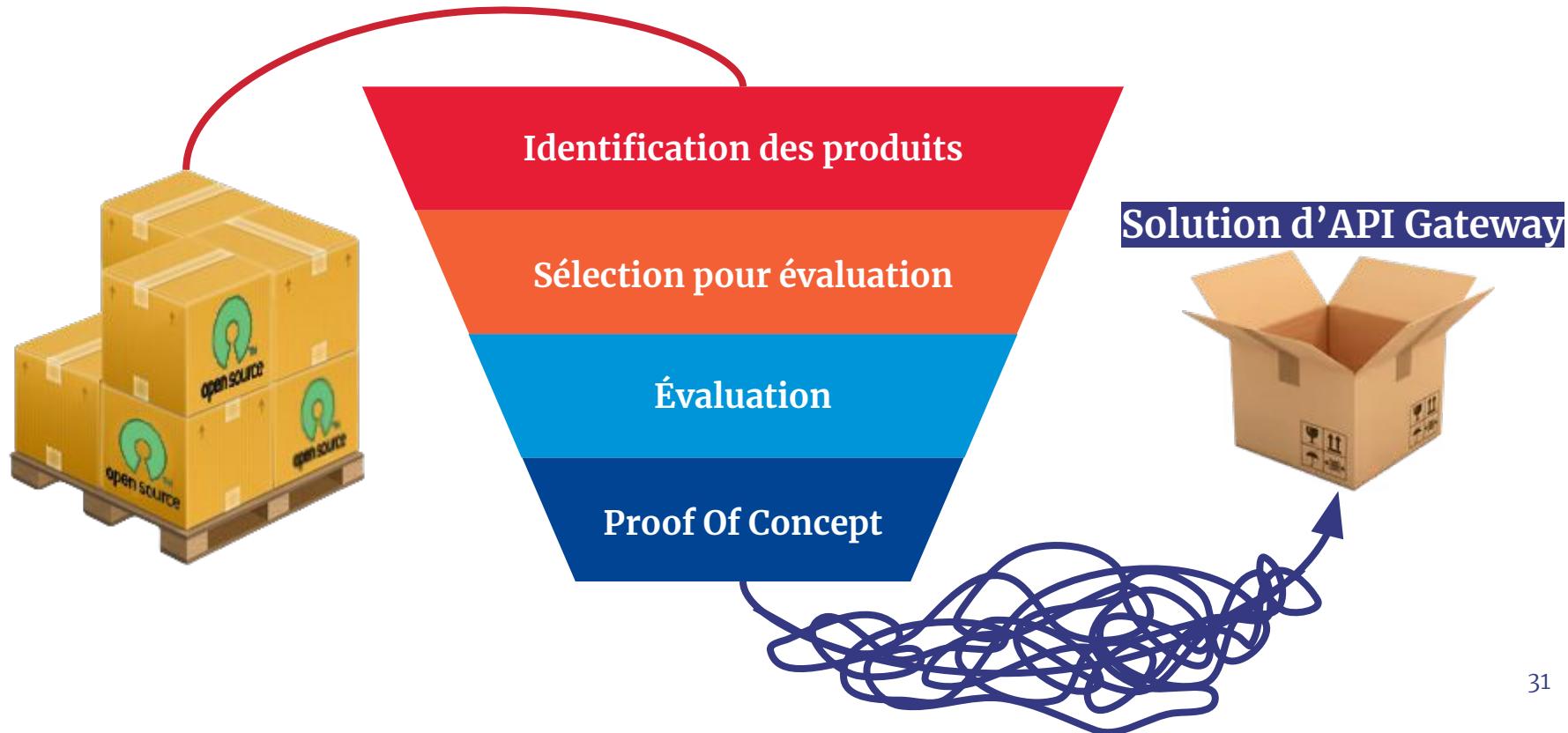
- Sécurité
- Intégrité des données

Position du Tech-Lab

- Efficacité
- Reproductibilité des choix
 - Objectivité
 - Traçabilité

Méthodologie de projet

Sélection du produit



Sélection du produit

Identification des produits

Sélection pour évaluation

Évaluation théorique

Proof Of Concept



Sélection du produit

Identification des produits

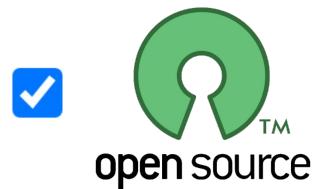
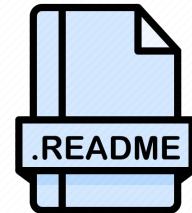
Sélection pour évaluation

Évaluation théorique

Proof Of Concept



Sélection du produit

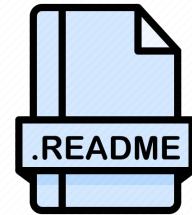


Niveau de maintenance

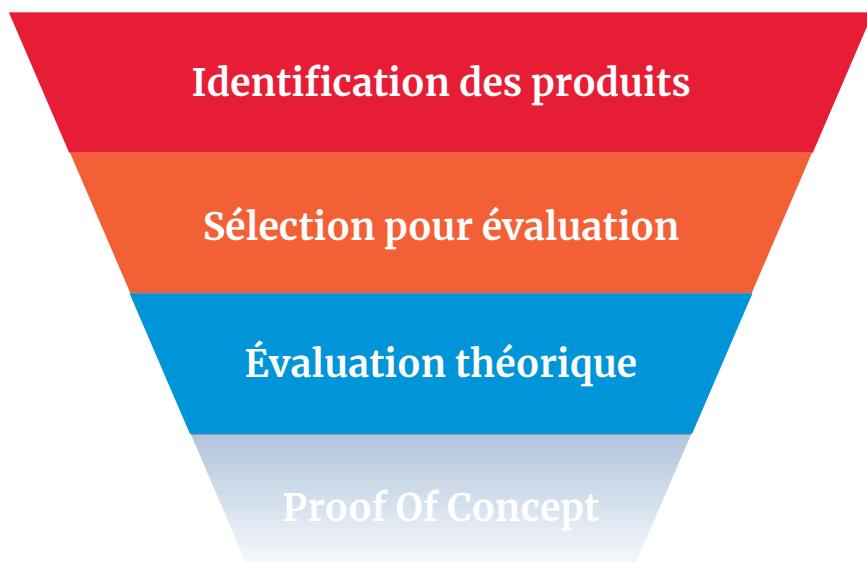
Langage de programmation

Maturité

Sélection du produit

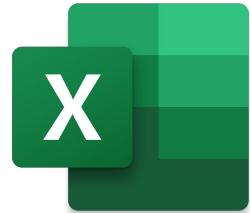
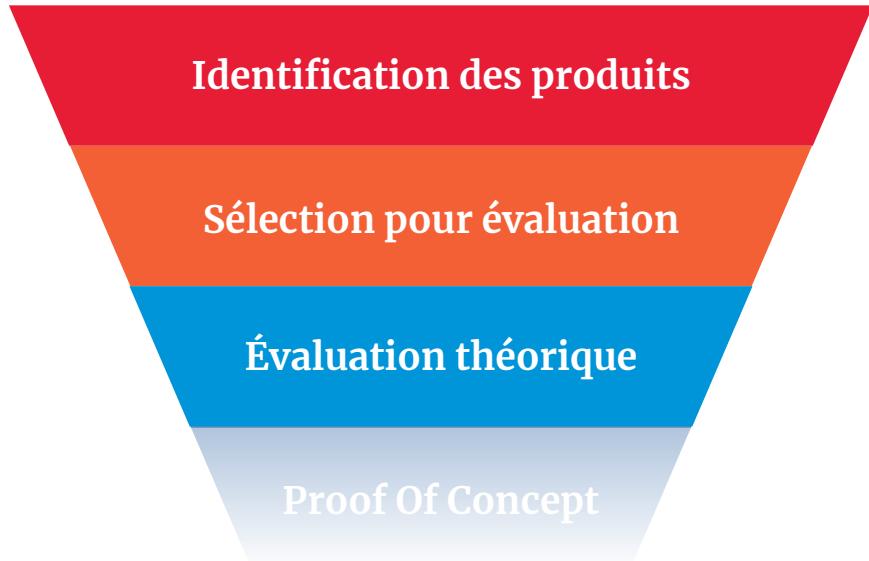


Sélection du produit



- Gateway Provider
- Operations ready by design
- Secure by design
- Resilient by design
- Roadmap, support et licenses

Sélection du produit



Proof Of Concept

Objectifs



krakenD



Operations ready by design

a. ...



Secure by design

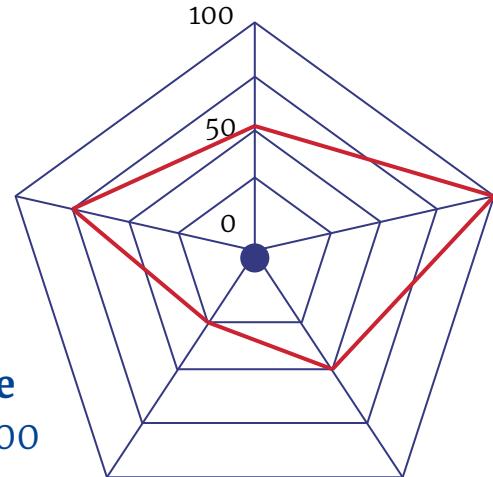
a. ...



Resilient by design

a. ...

Note
???/500



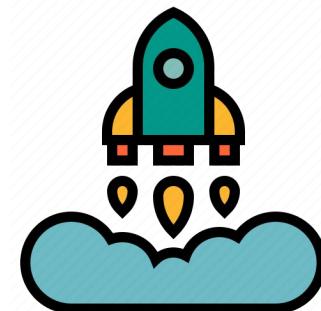
Vue d'ensemble

Initialisation

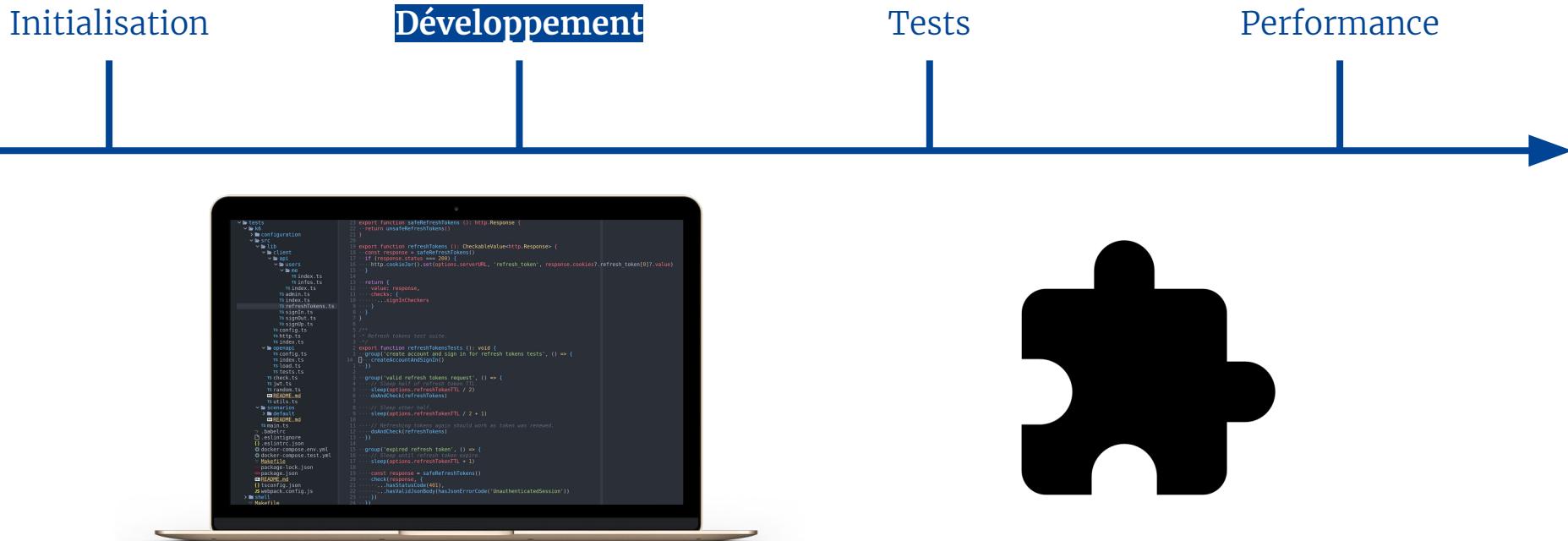
Développement

Tests

Performance



Vue d'ensemble



Vue d'ensemble

Initialisation

Développement

Tests

Performance



Grafana Labs



Vue d'ensemble

Initialisation

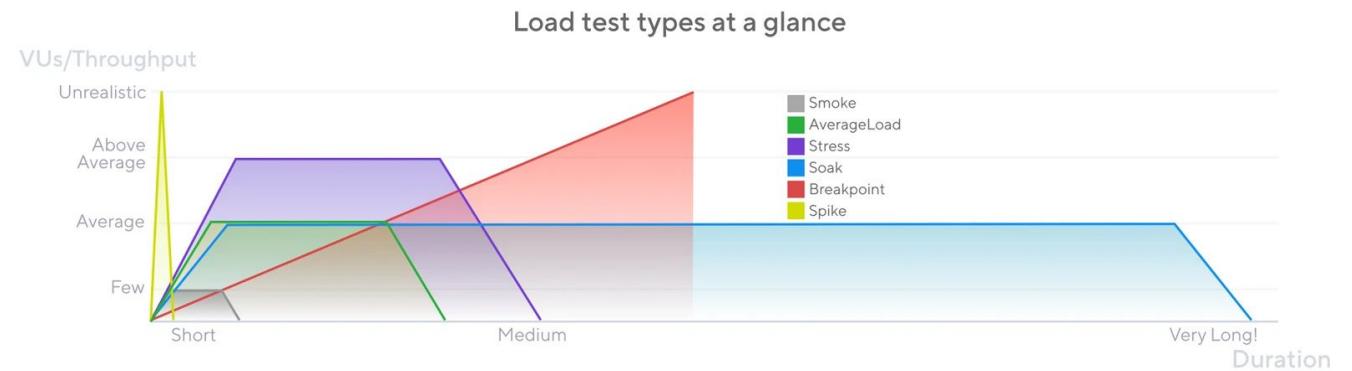
Développement

Tests

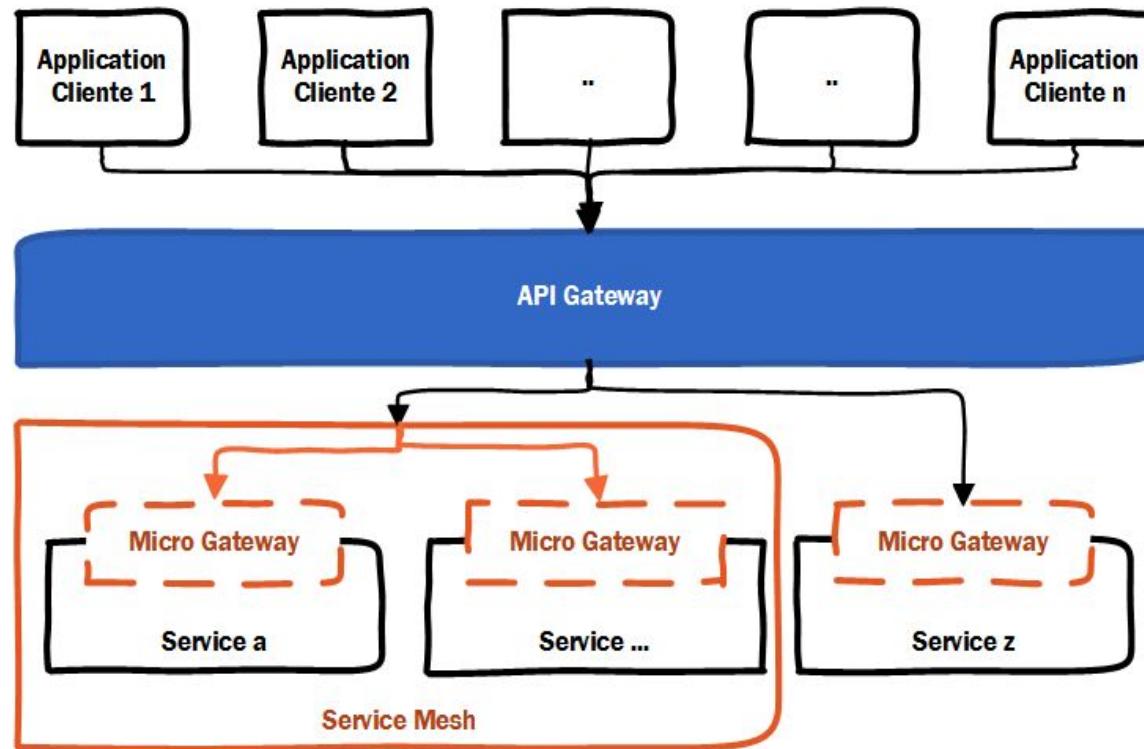
Performance



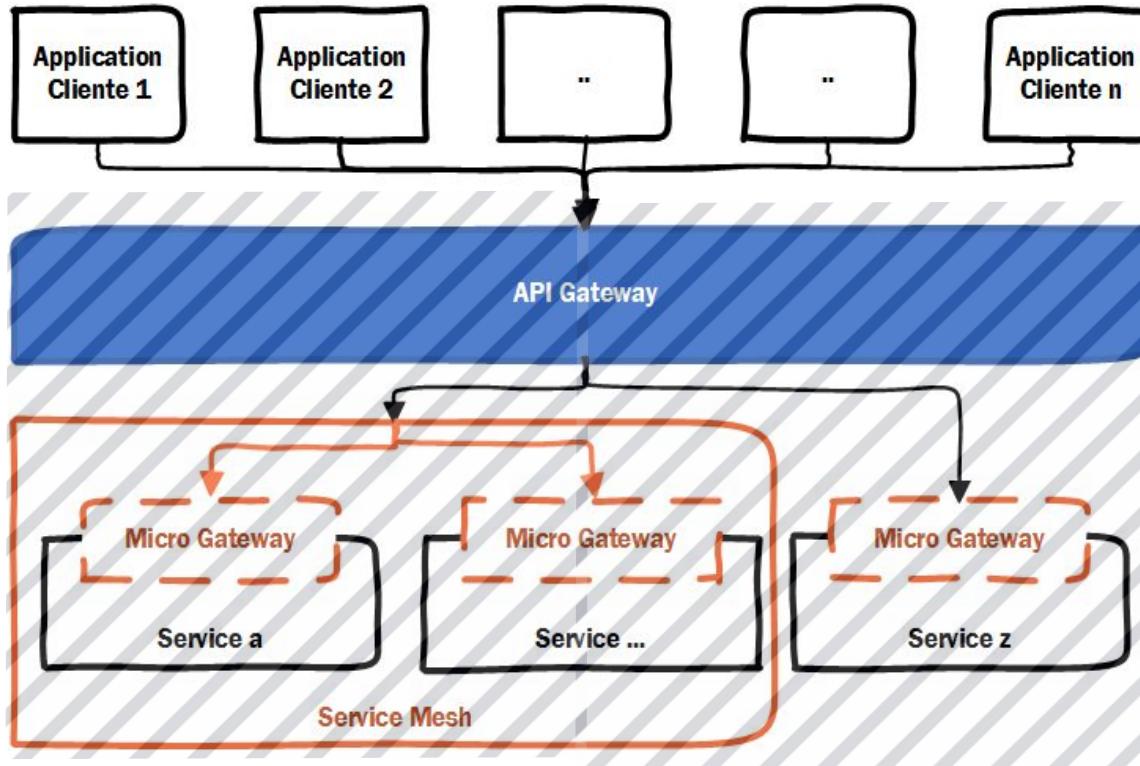
Grafana Labs



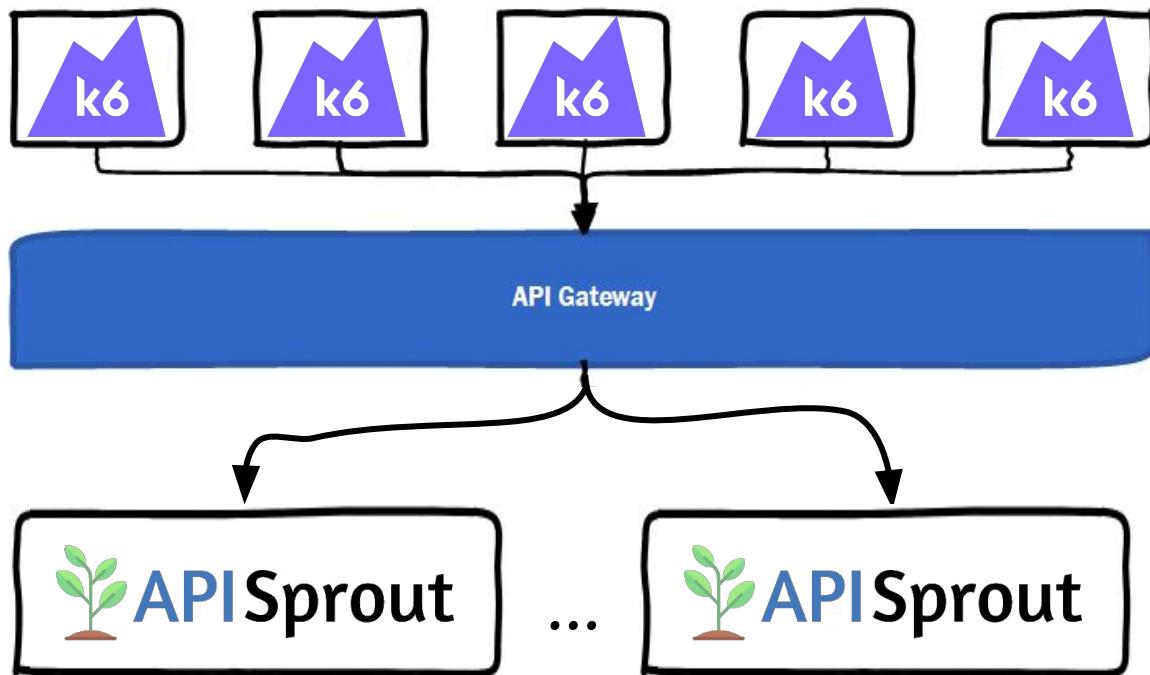
Pourquoi ?



Pourquoi ?



Environnement de test



Injecteurs

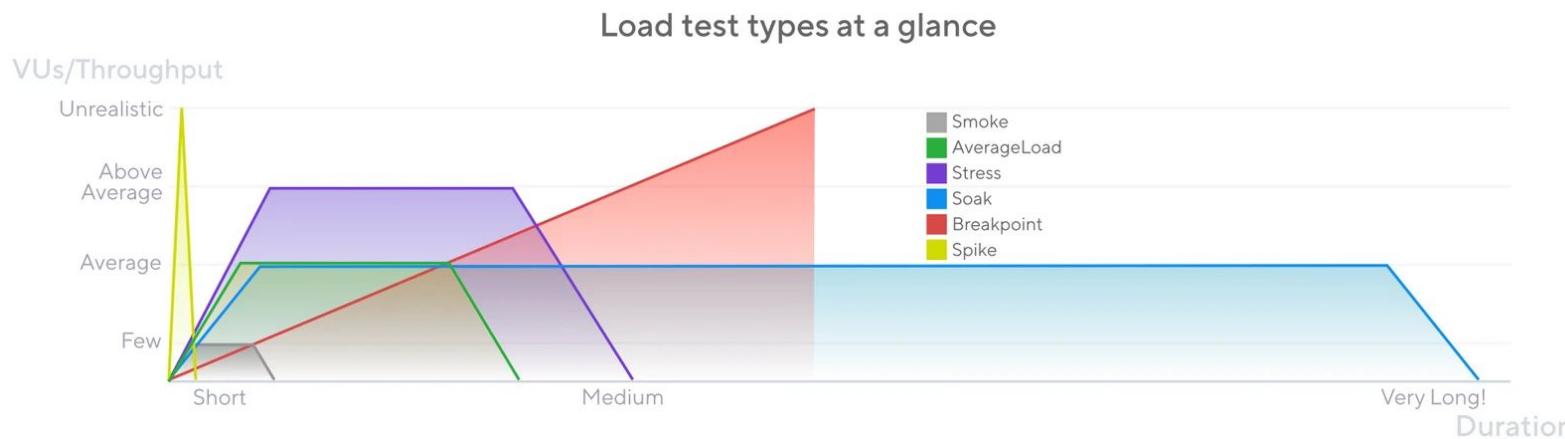
Krakend / Envoy

50 services

5 ressources

6 opérations

Tir de calibration

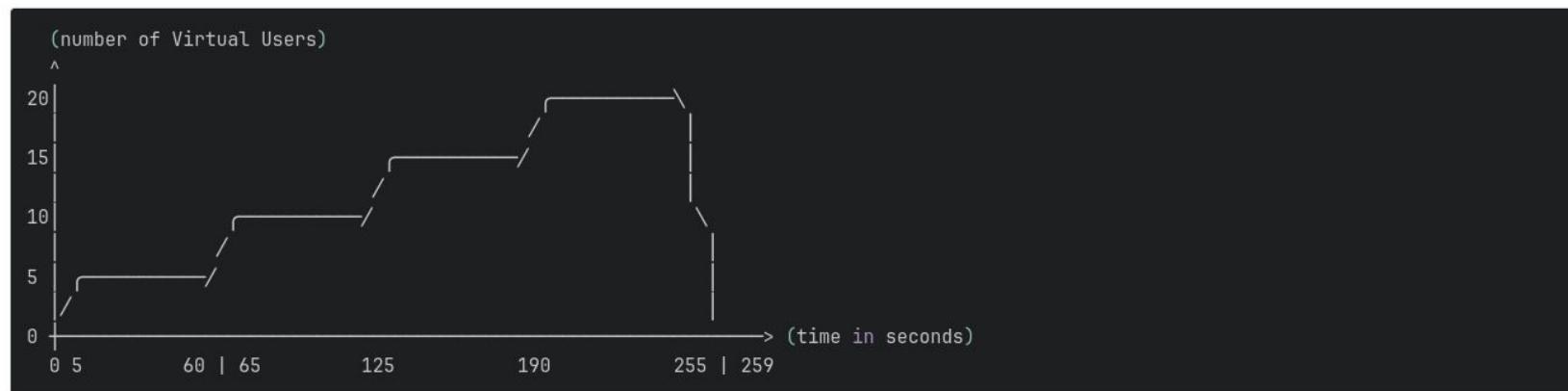


K6 configuration (benchmarks only)

K6 scenario (VU) is configurable with the following environment variables:

Variable name	Default value	Description
INITIAL_USERS	5	The number of virtual users at the beginning of the load test.
ADDITIONAL_USERS	5	The number of virtual users added during increase stages.
ADDITIONAL_USERS_PER_SEC	5	The number of virtual users added per seconds during increase stages.
STAGE_DURATION	60	The duration of flat stages in seconds.
MAX_USERS	20	The maximum number of virtual users.

So the default scenario is the following:

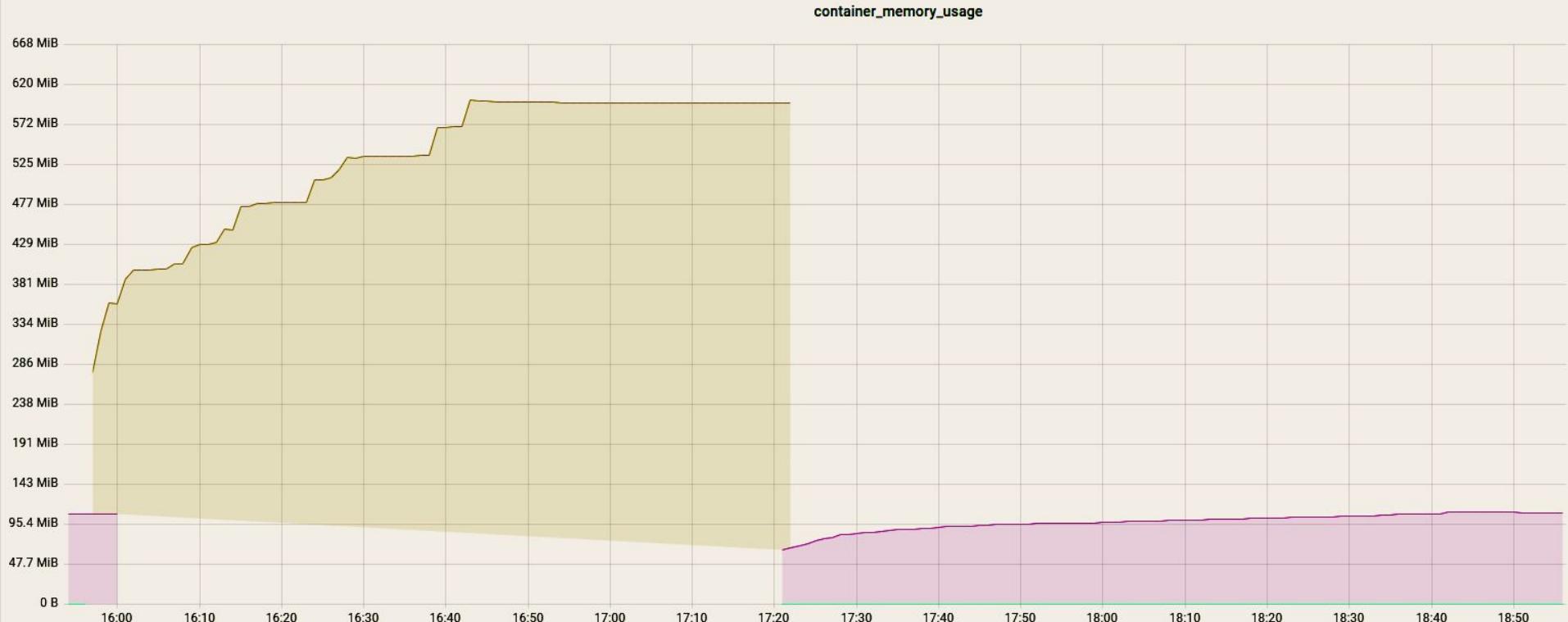


The scenario starts with a ramping stage. It adds `ADDITIONAL_USERS_PER_SEC` VU per second until it reaches the `INITIAL_USERS` number even if its greater than `MAX_USERS`. Then, the first flat stage starts during `STAGE_DURATION`. At the end of the flat stage, we add `ADDITIONAL_USERS` VU in `ADDITIONAL_USERS_PER_SEC / ADDITIONAL_USERS` seconds.⁸ After that, another flat stage starts and the algorithm is repeated until the number of VU reaches the max (`USERS_MAX`). Finally, we have the down ramp: `ADDITIONAL_USERS_PER_SEC` VU are removed until it reaches 0.

Résultats du tir - usage CPU



Résultats du tir - usage mémoire



Résultats du tir

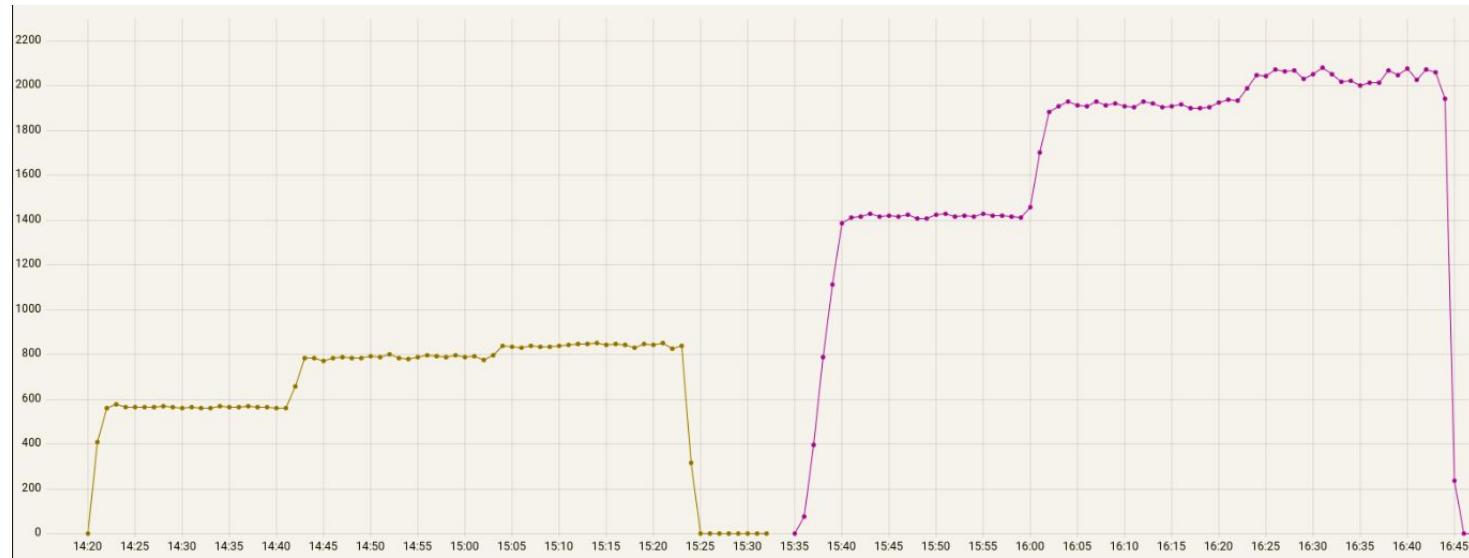


Autres tirs

Tir officiel

Tir de résilience

Tir d'endurance



Autres tirs

Tir officiel

Tir de résilience

Tir d'endurance

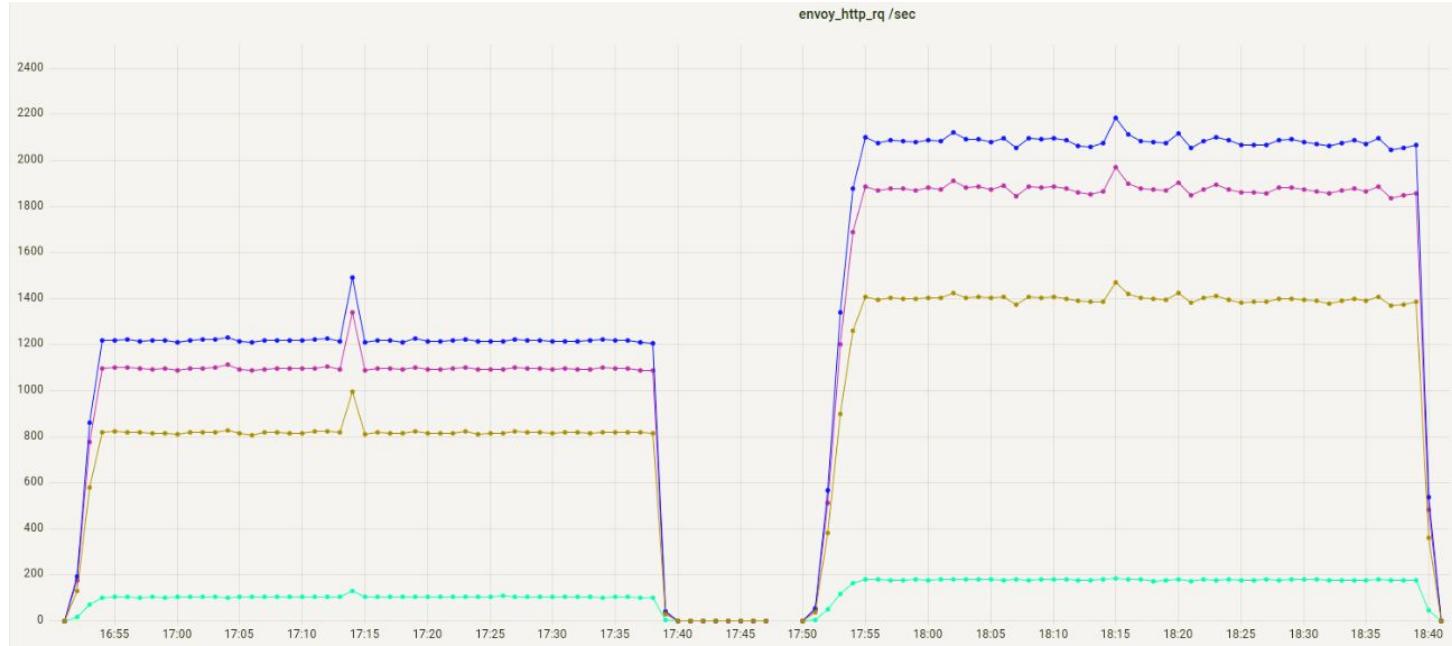


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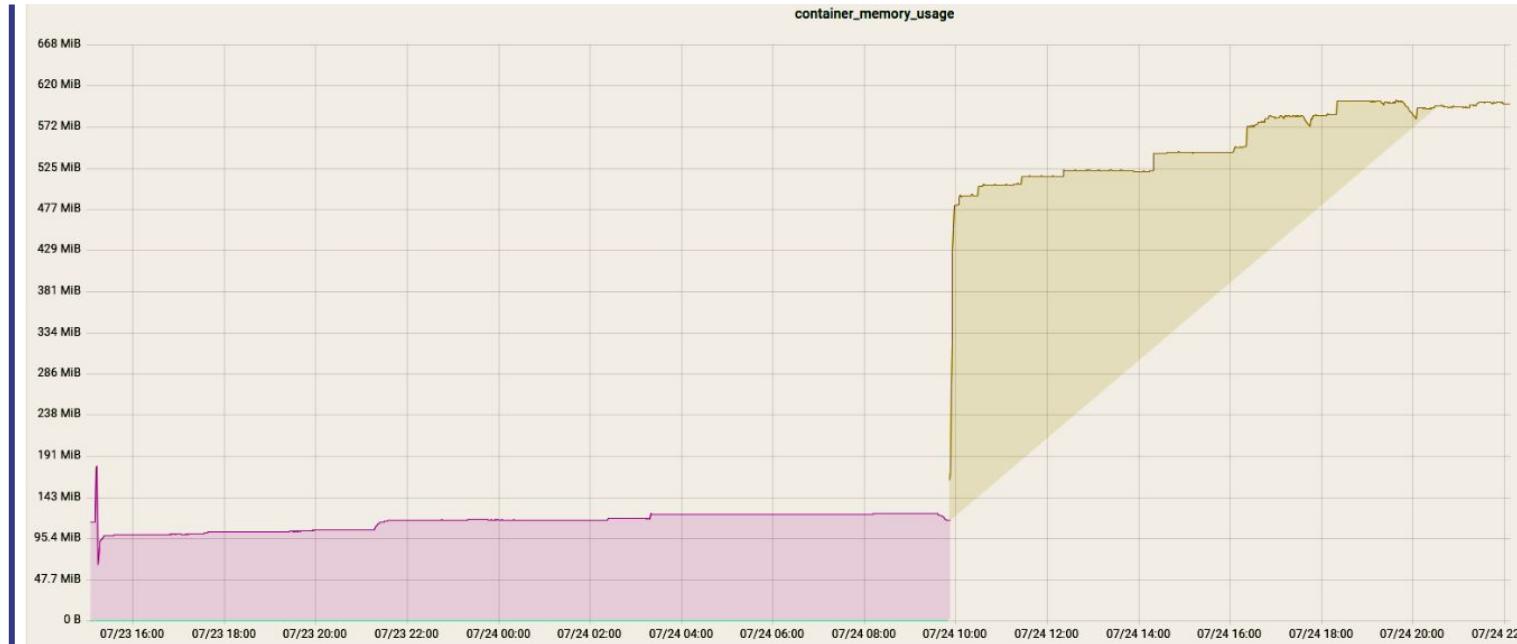


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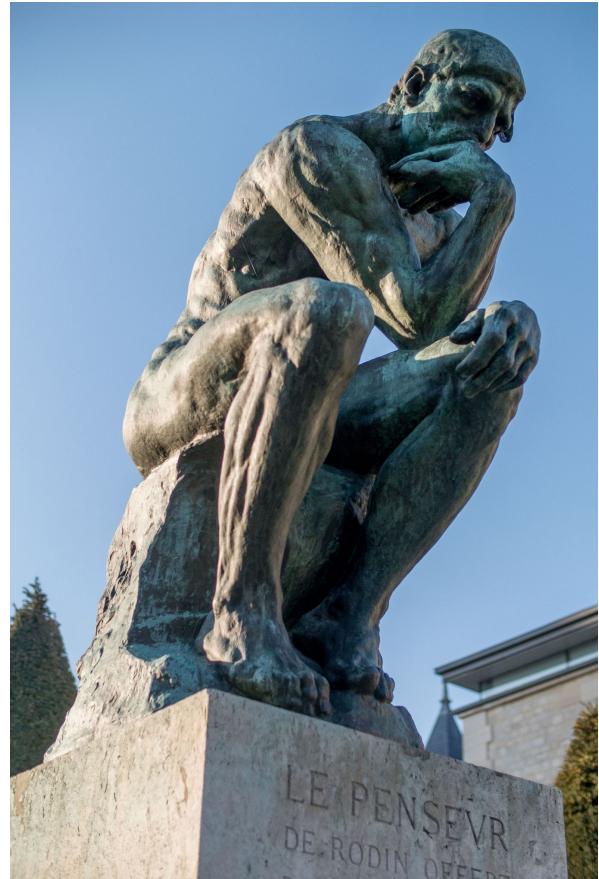
Classement



Conclusion

*“
Donne un poisson à un homme, il mangera un jour. Apprends-lui à pêcher, il mangera toute sa vie.*

”



MERCI!