

# Scaling Java Application

## Vers l'infini et au delà

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Architecte Java

**Bankin'**

# Présentation

- Moteur de calcul de prix d'assurances
- Backoffice de configuration des produits
- Exposition d'API à destination de partenaires

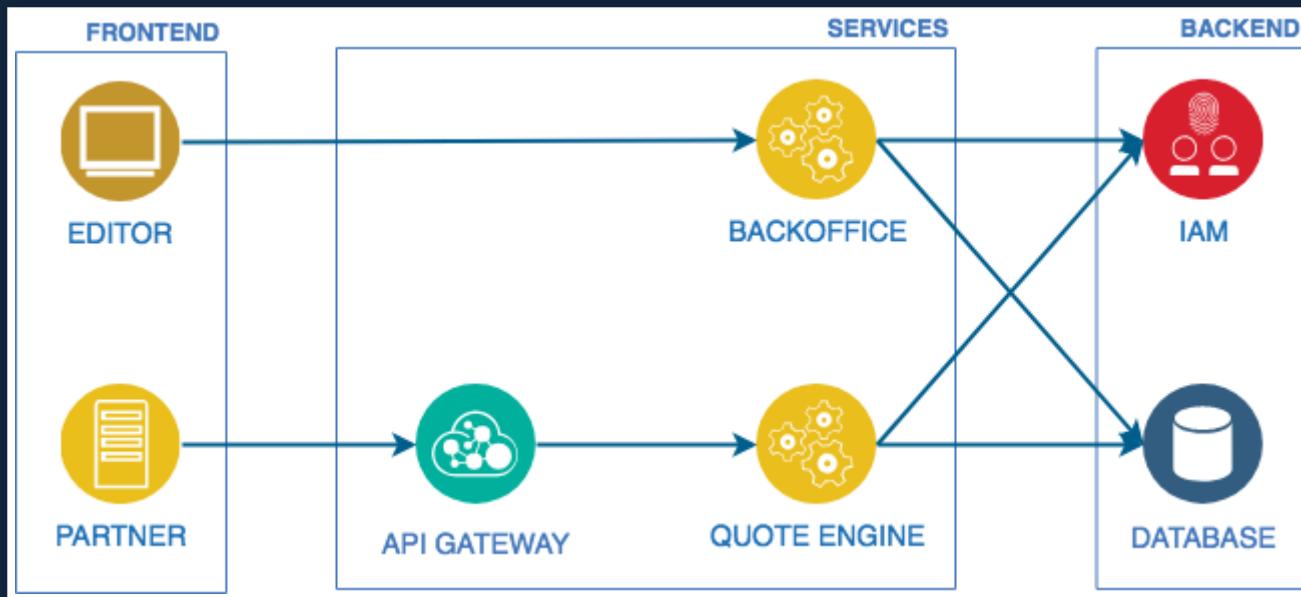
# Objectifs

- Temps de réponses < 50ms
- Nombre de req/s =  $\infty$

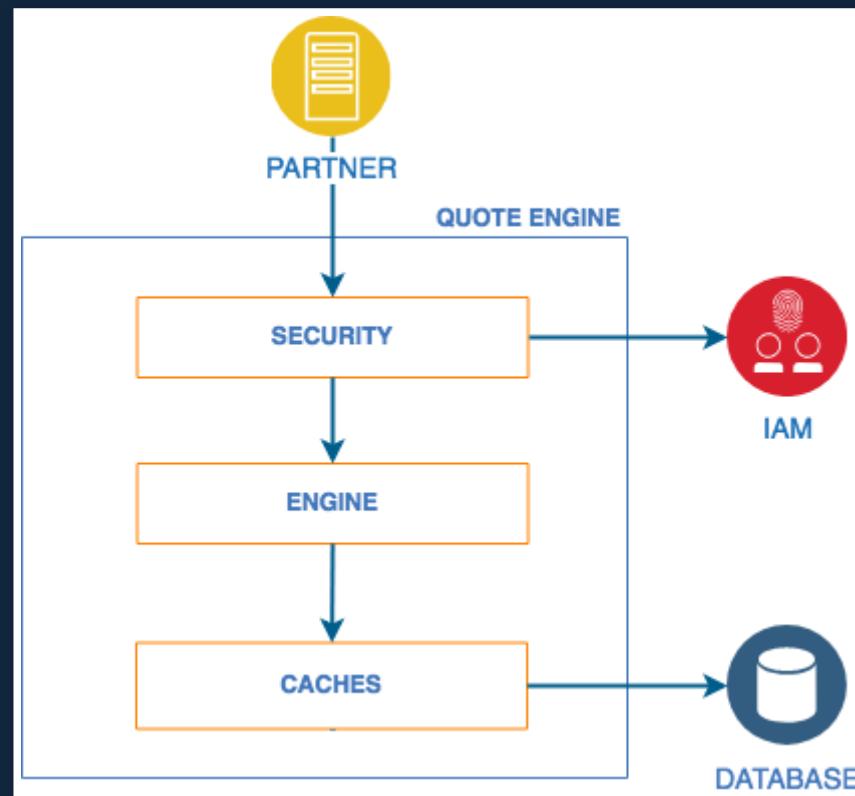
# Conception

- Stateless
- Réduction / Suppression des IO
- Utilisation cache
- Autoscaling ( basé sur CPU )

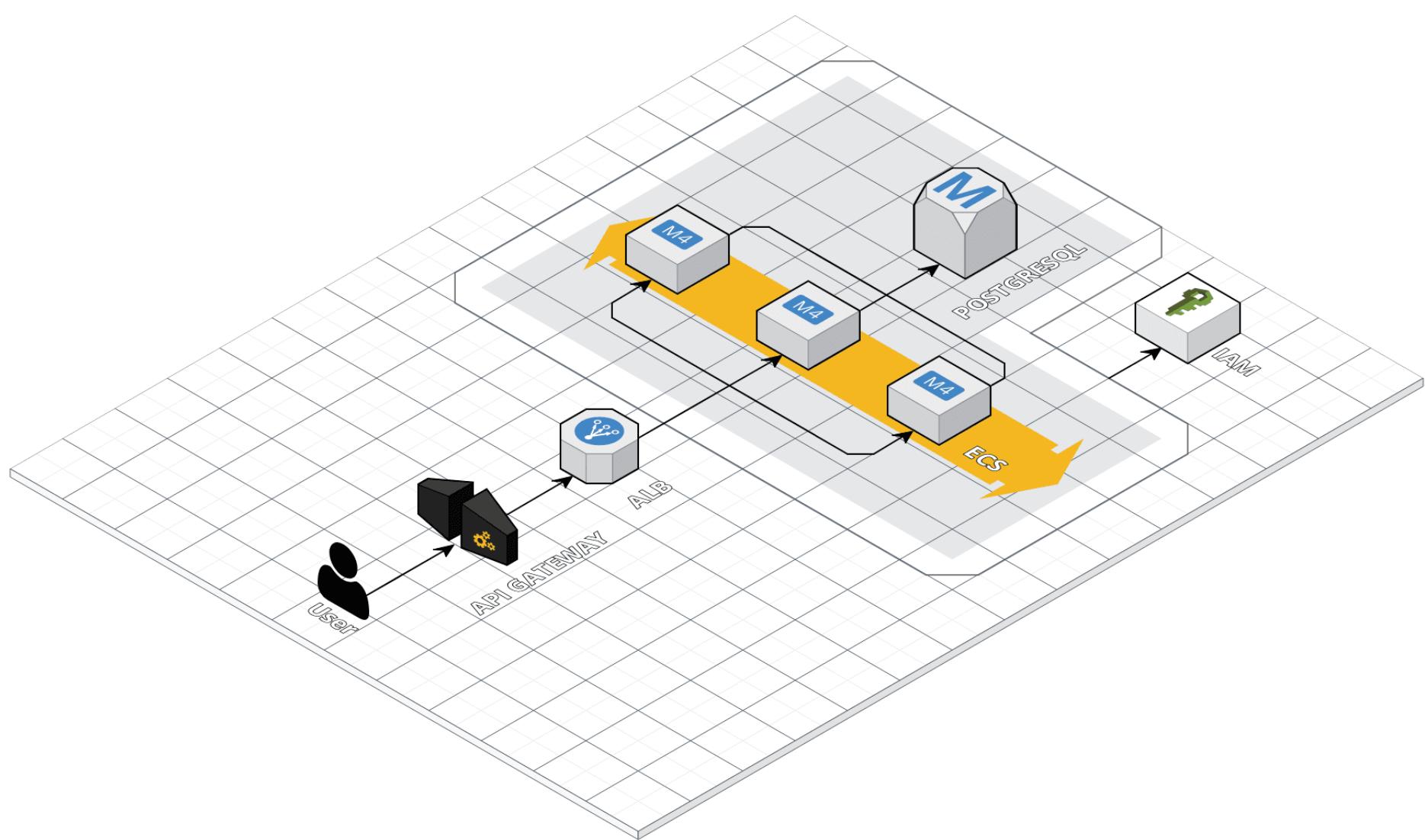
# Architecture



# Architecture



# Architecture



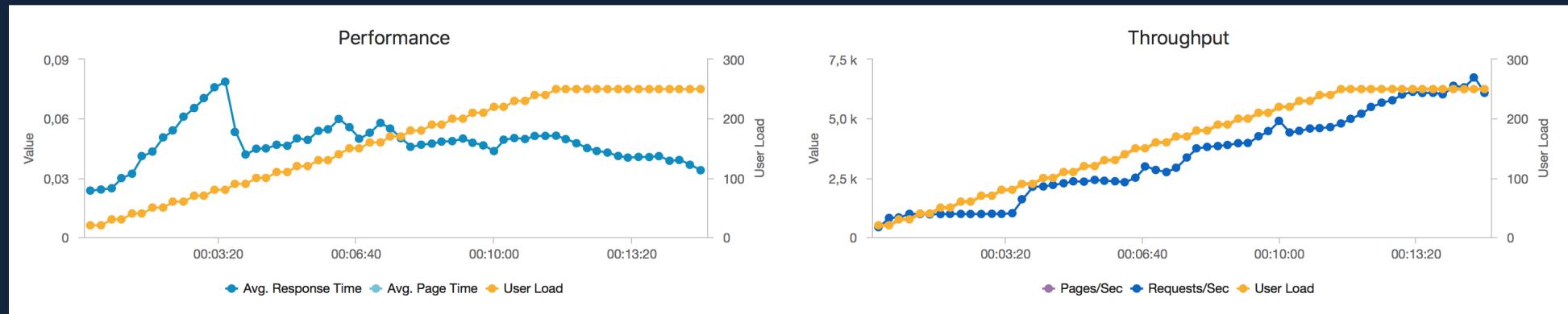
# Tests de charge

- 15 minutes
- 250 utilisateurs en //
- Ramp-Up de 10 mins

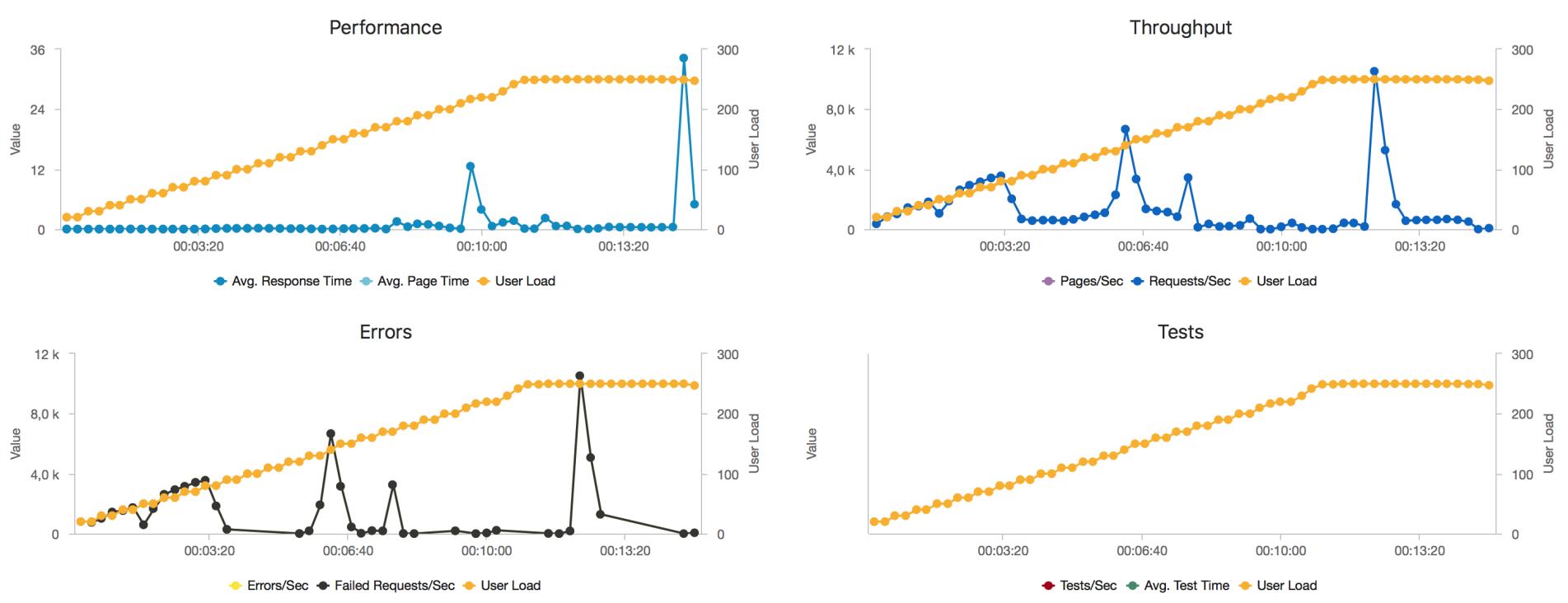
# Résultats attendus

- Temps de réponse constant < 80 ms
- Courbe de req/s croissante
- Taux d'erreur proche de 0

# Résultats attendu



# Résultats du premier run



# Round 1 : Analyse

## Timeline des événements ECS

Service : tiab-quoteengine		
Cluster	tiab-services	Desired count
Status	ACTIVE	Pending count
Task definition	tiab-quoteengine:27	Running count
Service type	REPLICAS	
Launch type	EC2	
Service role	aws-service-role/ecs.amazonaws.com/AWSServiceRoleForECS	
Details	Tasks	Events
Auto Scaling	Deployments	Metrics
Logs		
Last updated on September 24, 2018 4:49:34 PM (0m ago)		
<input type="button" value="Filter in this page"/> < 1-100 >		
Event Id	Event Time	Message
68f1215f-c5ca-4732-9354-94c4da2d0d05	2018-09-24 16:49:25 +0200	service <a href="#">tiab-quoteengine</a> deregistered 1 targets in target-group <a href="#">tiab-quoteengine</a>
75f45ce8-f16f-425c-b014-93c04a98c332	2018-09-24 16:49:10 +0200	service <a href="#">tiab-quoteengine</a> has begun draining connections on 1 tasks.
e9f9b963-5657-4347-ab7d-ad71be79a769	2018-09-24 16:49:10 +0200	service <a href="#">tiab-quoteengine</a> deregistered 1 targets in target-group <a href="#">tiab-quoteengine</a>
26236bfc-d71f-4042-b740-54b02151720b	2018-09-24 16:48:46 +0200	service <a href="#">tiab-quoteengine</a> has reached a steady state.
96e335b5-901d-41b8-9e6a-b252ce78b7a7	2018-09-24 16:48:24 +0200	service <a href="#">tiab-quoteengine</a> registered 2 targets in target-group <a href="#">tiab-quoteengine</a>
a298ad81-dbeb-4b4a-a66f-e6d0f7f37142	2018-09-24 16:48:11 +0200	service <a href="#">tiab-quoteengine</a> has started 2 tasks: task <a href="#">2fe88c35-b118-4fc4-bf93-39b0565d864e</a> task <a href="#">29589ff-27a1-45d0-8067-3499a451fdc6</a> .
8d10f1ef-fbdd-47bc-8664-0168e94346b5	2018-09-24 16:47:31 +0200	Message: Successfully set desired count to 3. Change successfully fulfilled by ecs. Cause: monitor alarm StepScaling-service/tiab-services /tiab-quoteengine-AlarmHigh in state ALARM triggered policy quoteengine-scaleUp
b0791bc8-6df5-4617-b15b-697cecb3afe9	2018-09-24 16:46:37 +0200	service <a href="#">tiab-quoteengine</a> has reached a steady state.
4126a886-629e-47f0-8c3b-f7b3c420e541	2018-09-24 16:46:15 +0200	service <a href="#">tiab-quoteengine</a> registered 1 targets in target-group <a href="#">tiab-quoteengine</a>
9502c9db-9ea9-45ca-a8cd-fb4255040a8d	2018-09-24 16:46:04 +0200	service <a href="#">tiab-quoteengine</a> has started 1 tasks: task <a href="#">4867f104-ee4f-4562-b78a-66deda78871f</a> .
fdc2d567-d40a-4be1-bfab-5e84ebb03c63	2018-09-24 16:45:29 +0200	service <a href="#">tiab-quoteengine</a> has begun draining connections on 1 tasks.
73291b0e-9928-468e-81d6-d6dc1b2810ea	2018-09-24 16:45:29 +0200	service <a href="#">tiab-quoteengine</a> deregistered 1 targets in target-group <a href="#">tiab-quoteengine</a>

# Round 1 : Analyse

## Liste des tâches

Clusters > tiab-services > Service: tiab-quoteengine

Service : tiab-quoteengine

Cluster: tiab-services Status: ACTIVE Task definition: tiab-quoteengine:27 Desired count: 4 Pending count: 0 Running count: 3

Service type: REPLICA Launch type: EC2 Service role: aws-service-role/ecs.amazonaws.com/AWSServiceRoleForECS

Details Tasks Events Auto Scaling Deployments Metrics Logs

Last updated on September 24, 2018 4:51:16 PM (0m ago) Update Delete

Task status: Running Stopped

Filter in this page Page size: 50

Task	Task Definition	Last status	Desired status	Group	Launch type
0283c93c-06be-4937-ab79...	tiab-quoteengine:27	STOPPED (Scaling activity initiated by (deployment e...)	STOPPED	service:tiab-quoteengine	EC2
1ef8c334-61aa-4e50-b3d5...	tiab-quoteengine:27	STOPPED (Essential container in task exited)	STOPPED	service:tiab-quoteengine	EC2
29589f71-27a1-45d0-8067...	tiab-quoteengine:27	STOPPED (Essential container in task exited)	STOPPED	service:tiab-quoteengine	EC2
2fe88c35-b118-4fc4-b793-3...	tiab-quoteengine:27	STOPPED (Essential container in task exited)	STOPPED	service:tiab-quoteengine	EC2
4867f104-ee4f-4562-b78a-6...	tiab-quoteengine:27	STOPPED (Essential container in task exited)	STOPPED	service:tiab-quoteengine	EC2
74864d32-3264-4035-bfb3...	tiab-quoteengine:27	STOPPED (Essential container in task exited)	STOPPED	service:tiab-quoteengine	EC2
77dd85cd-2cb0-47c3-bc90...	tiab-quoteengine:27	STOPPED (Essential container in task exited)	STOPPED	service:tiab-quoteengine	EC2
89764279-a8ea-43d4-a13a...	tiab-quoteengine:27	STOPPED (Essential container in task exited)	STOPPED	service:tiab-quoteengine	EC2
b2121bd-7fa2-4f1b-b70d-d...	tiab-quoteengine:27	STOPPED (Essential container in task exited)	STOPPED	service:tiab-quoteengine	EC2
b4175b17-255b-4e80-9d76...	tiab-quoteengine:27	STOPPED (Essential container in task exited)	STOPPED	service:tiab-quoteengine	EC2
b9e232cc-9b7f-4fb4-a9c5...	tiab-quoteengine:27	STOPPED (Essential container in task exited)	STOPPED	service:tiab-quoteengine	EC2
fef003c8-d45d-4546-ab96...	tiab-quoteengine:27	STOPPED (Scaling activity initiated by (deployment e...)	STOPPED	service:tiab-quoteengine	EC2

# Round 1 : Analyse

## Détail d'une tâche

Clusters > tiab-services > Task: 1ef8c334-61aa-4e50-b3d5-4f28ffa29220

Task : 1ef8c334-61aa-4e50-b3d5-4f28ffa29220

Run more like this Stop

Details Logs

Cluster tiab-services

Container instance 97137f95-4316-47d6-b461-cd0269426d01

EC2 instance id i-0929d094c2fc8c452

Launch type EC2

Task definition tiab-quoteengine:27

Group service:tiab-quoteengine

Task role None

Last status STOPPED

Desired status STOPPED

Created at 2018-09-24 16:49:33 +0200

Network

Network mode bridge

Containers

Last updated on September 24, 2018 4:51:54 PM (0m ago)

Name	Container Id	Status	Image	CPU Units	Hard/Soft memori...	Essential
main	d53a6896-720e-43c1-9d8d-f50a72cf887	STOPPED (OutOfMemoryError)	947226147474.dkr...	2048	896/-	true

Details

Status reasonOutOfMemoryError: Container killed due to memory usage  
Exit Code137

Network bindings

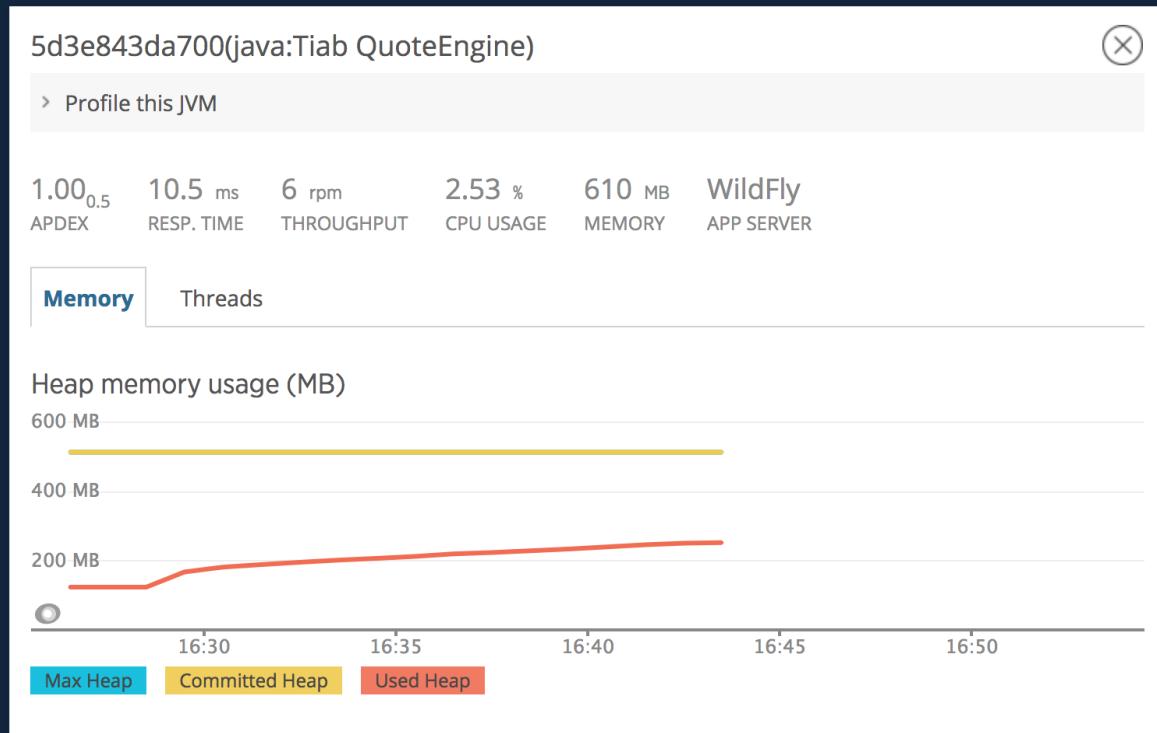
Host Port	Container Port	Protocol	External Link
32775	8080	tcp	10.1.1.175:32775

Environment Variables

Key	Value
JAVA_OPTS	-Xms512m -Xmx512m -XX:MaxMetaspaceSize=96m -XX:+UseG1GC
QUOTEENGINE_SECURITY_OAUTH2_RESOURCE_JWK_KEYSETURLS	https://iam.tiab.ekinosandbox-aws.ekino.com/.well-known/jwks.json
SPRING_DATASOURCE_PASSWORD	postgres

# Round 1 : Analyse

## Statistiques JVM



# Round 1 : Debug

# Round 1 : Debug

## Dépendances

```
version: '3'

services:

  postgresql:
    image: postgres:10.1
    ports:
      - 5432:5432

  hydra:
    image: oryd/hydra:v1.0.0-beta.9
    ports:
      - 4444:4444
      - 4445:4445
    command:
      serve all --dangerous-force-http
```

# Round 1 : Debug

## Lancement application

```
$ docker run -it -p 8080:8080 -p 1099:1099 \
-e JAVA_OPTS='
-Xms512m
-Xmx512m
-XX:MaxMetaspaceSize=128m
-XX:+UseG1GC
-XX:NativeMemoryTracking=summary
-Djava.rmi.server.hostname=localhost
-Dcom.sun.management.jmxremote
-Dcom.sun.management.jmxremote.port=1099' \
--memory 896m \
--memory-swap 896m \
--name quoteengine_service \
quoteengine_service
```

# Round 1 : Debug

## Simulation latences

```
$ docker run --name quoteengine_pumba_hydra_1 -d \
  gaiaadm/pumba:master netem \
  --duration 3600m delay --time 500 quoteengine_hydra_1

$ docker run --name quoteengine_pumba_postgresql_1 -d \
  gaiaadm/pumba:master netem \
  --duration 3600m --time 200 quoteengine_postgresql_1
```

# Round 1 : Debug

## Lancement des tests

The screenshot shows the JMeter interface with a test plan tree on the left and a configuration editor on the right.

**Test Plan Tree:**

- Neo Travel
- Thread Group (selected)
- Generate Quote
- HTTP Header Manager
- Summary Report
- View Results Tree
- Aggregate Graph
- Response Time Graph
- Graph Results

**Configuration Editor - Thread Group Tab:**

**Name:** Thread Group

**Comments:** Action to be taken after a Sampler error

**Action radio buttons:** Continue (selected), Start Next Thread Loop, Stop Thread, Stop Test, Stop Test Now

**Thread Properties:**

- Number of Threads (users): 25
- Ramp-Up Period (in seconds): 15
- Loop Count:  Forever
- Delay Thread creation until needed
- Scheduler

**Scheduler Configuration:**

- Duration (seconds): 900
- Startup delay (seconds): [empty]

# Round 1 : Debug

## Stats docker au lancement

CONTAINER ID	NAME	CPU %	MEM USAGE / LIMIT	MEM %
98f23548a9ce	quoteengine_service	0.26%	596.3MiB / 896MiB	66.55%
84179ee11ac5	quoteengine_pumba_hydra_1	0.00%	3.793MiB / 5.817GiB	0.06%
3f6d34da3e6e	quoteengine_postgresql_1	0.11%	19.24MiB / 5.817GiB	0.32%
1e257673dc5d	quoteengine_hydra_1	0.00%	6.523MiB / 5.817GiB	0.11%

# Round 1 : Debug

Stats docker après 30s

CONTAINER ID	NAME	CPU %	MEM USAGE / LIMIT	MEM %
98f23548a9ce	quoteengine_service	148.43%	895MiB / 896MiB	99.88%
84179ee11ac5	quoteengine_pumba_hydra_1	0.00%	3.793MiB / 5.817GiB	0.06%
3f6d34da3e6e	quoteengine_postgresql_1	0.04%	29.41MiB / 5.817GiB	0.49%
1e257673dc5d	quoteengine_hydra_1	0.00%	5.602MiB / 5.817GiB	0.09%

# Round 1 : Debug

Stats docker après 1min

CONTAINER ID	NAME	CPU %	MEM USAGE / LIMIT	MEM %
84179ee11ac5	quoteengine_pumba_hydra_1	0.00%	3.793MiB / 5.817GiB	0.06%
3f6d34da3e6e	quoteengine_postgresql_1	1.86%	14.48MiB / 5.817GiB	0.24%
1e257673dc5d	quoteengine_hydra_1	0.00%	5.602MiB / 5.817GiB	0.09%

# Round 1 : Debug

## Etat de l'application

```
2019-03-20 18:34:17.686 INFO 6 --- [           main] o.s.b.w.e.u.UndertowServletWebServer      : Undertow started on port(s) 8080 (http) with context path ''
2019-03-20 18:34:17.690 INFO 6 --- [           main] com.vanroy.tiab.quoteengine.Application   : Started Application in 7.885 seconds (JVM running for 9.615)
2019-03-20 18:35:00.878 INFO 6 --- [ XNIO-2 task-1] io.undertow.servlet                  : Initializing Spring FrameworkServlet 'dispatcherServlet'
2019-03-20 18:35:00.879 INFO 6 --- [ XNIO-2 task-1] o.s.web.servlet.DispatcherServlet        : FrameworkServlet 'dispatcherServlet': initialization started
2019-03-20 18:35:00.899 INFO 6 --- [ XNIO-2 task-1] o.s.web.servlet.DispatcherServlet        : FrameworkServlet 'dispatcherServlet': initialization complete
d in 20 ms
Killed
```

# Round 1 : Debug

## Analyse mémoire

```
~/D/t/s/quoteengine >>> docker exec -it quoteengine_service bash
root@639d0cf6745b:/# jps
450 Jps
6 jar
root@639d0cf6745b:/# jcmt 6 GC.class_histogram | grep Total
Total          472051      26015704
root@639d0cf6745b:/# ps -o rss 6
    RSS
946520
root@639d0cf6745b:/# jcmt 6 VM.native_memory summary
6:

Native Memory Tracking:

Total: reserved=2071521KB, committed=815633KB
-
        Java Heap (reserved=524288KB, committed=524288KB)
                  (mmap: reserved=524288KB, committed=524288KB)

-
        Class (reserved=1101499KB, committed=59835KB)
                  (classes #10667)
                  (malloc=1723KB #21900)
                  (mmap: reserved=1099776KB, committed=58112KB)

-
        Native Memory Tracking (reserved=2849KB, committed=2849KB)
                  (malloc=14KB #161)
                  (tracking overhead=2835KB)

-
        Arena Chunk (reserved=189KB, committed=189KB)
                  (malloc=189KB)

-
        Unknown (reserved=1024KB, committed=0KB)
                  (mmap: reserved=1024KB, committed=0KB)
```

# Round 1 : Debug

Recherche Bug JVM

Oracle Technology Network > Java > Java SE > Community > Bug Database

## JDK-4797189 : Finalizers not called promptly enough

Type: Enhancement

Component: hotspot

Sub-Component: gc

Affected Version:

1.1.6,1.3.1\_12,1.4.1,1.4.2,6u7-rev, ...

Priority: P3

Status: Closed

Resolution: Won't Fix

OS: generic,solaris\_7,solaris\_9, ...

CPU: generic,x86,sparc

Submitted: 2002-12-21

Updated: 2014-04-08

Resolved: 2012-04-10

## Related Reports

Duplicate : [JDK-4899343 - CMS collector: prompter finalization?](#)

Duplicate : [JDK-5072161 - OutOfMemoryError while using GZIPOutputStream](#)

Relates : [JDK-7010249 - Many ParallelClassLoadingTests fail with "Too Many Open Files"](#)

Relates : [JDK-6751792 - OutOfMemory error from native leak in PNGEnoder class?](#)

Relates : [JDK-5092131 - using 1 MB pagesize throws "not enough space" error with 32bit JVM](#)

Relates : [JDK-6709675 - OutOfMemoryError observed during longevity run of Galactica app with GlassFish V3](#)

Relates : [JDK-6734186 - Native memory leak in java.util.zip.Deflater / thread saftey](#)

Relates : [JDK-6687968 - PNGImageReader leaks native memory through an Inflater.](#)

Relates : [JDK-5105410 - ZipFile\\$ZipFileInputStream doesn't close handle to zipfile](#)

# Round 1 : Debug

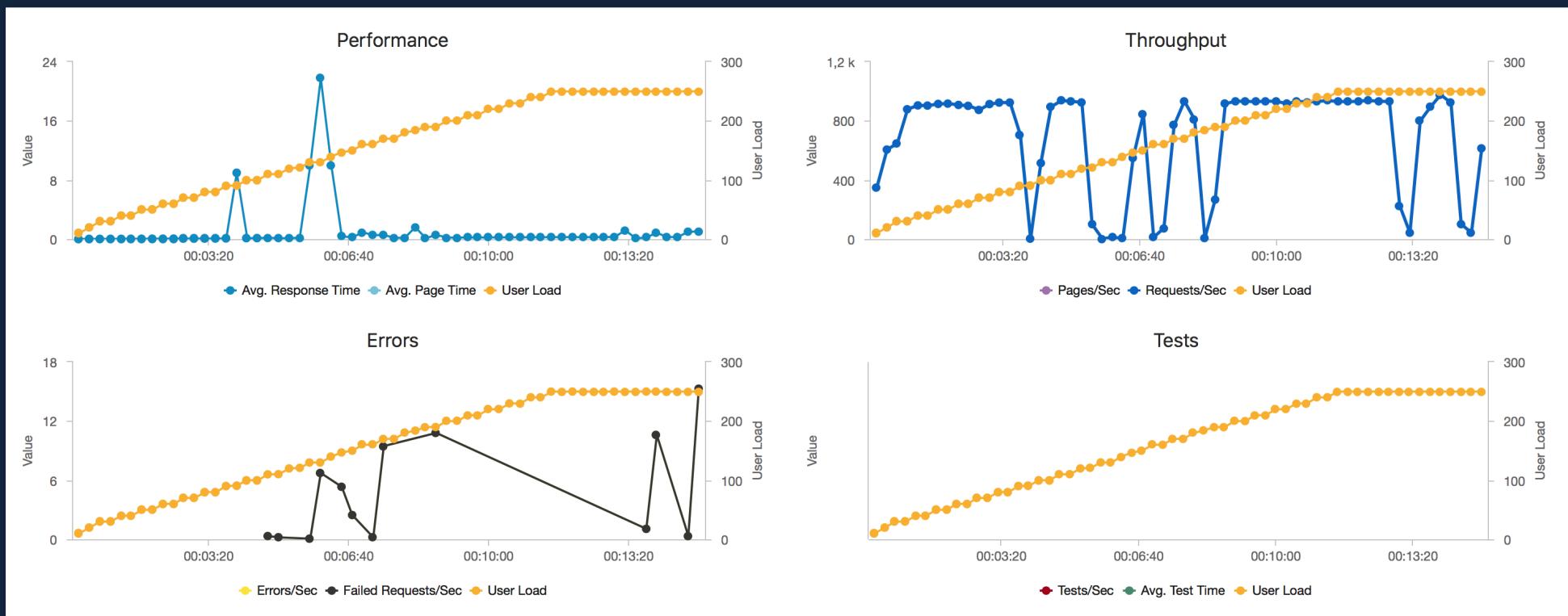
## Résolution

```
private static byte[] compress(byte[] data) throws IOException {
    Deflater deflater = new Deflater();
    deflater.setInput(data);
    try (ByteArrayOutputStream outputStream = new ByteArrayOutputStream();
        deflater.finish();
        byte[] buffer = new byte[1024];
        while (!deflater.finished()) {
            int count = deflater.deflate(buffer);
            outputStream.write(buffer, 0, count);
        }
        return outputStream.toByteArray();
    } finally {
        deflater.end();
    }
}
```

# Round 1 : Tests

# Round 1 : Résultats

## Fuite mémoire résolue



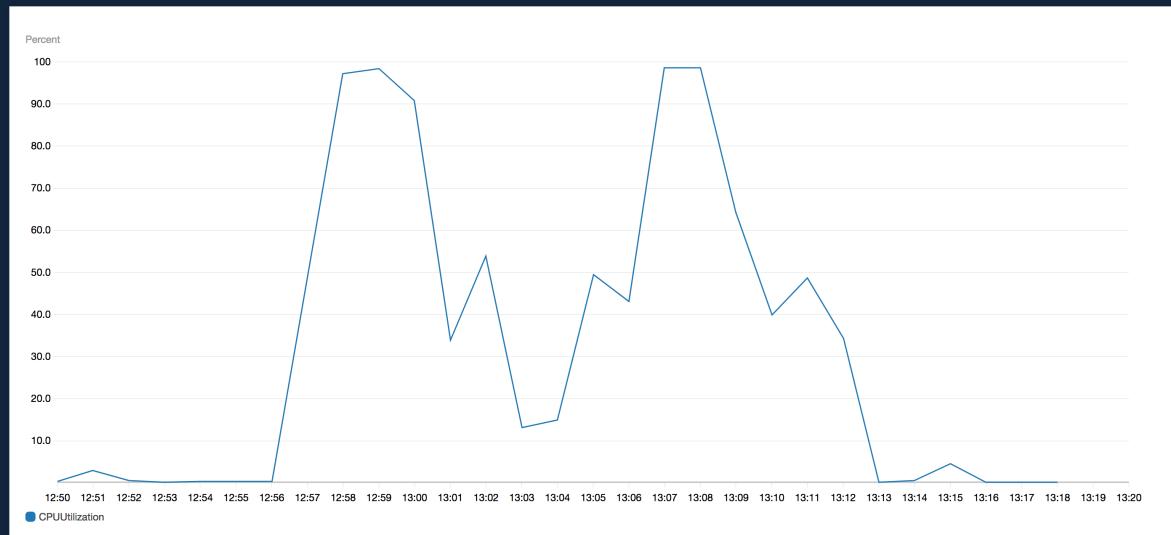
# Round 2 : Analyse

## Timeline des événements ECS

d593ec5a-cdec-44dc-a562-7a36939b4605	2018-09-25 15:12:13	service <a href="#">tiab-quoteengine</a> has stopped 1 running tasks: task <a href="#">d5af7128-e21a-4b9e-8da5-a299f17075e2</a> . +0200
71c99158-a02e-423a-a5a7-efaa68a0cd0dd	2018-09-25 15:12:13	service <a href="#">tiab-quoteengine</a> deregistered 1 targets in target-group <a href="#">tiab-quoteengine</a> +0200
89dc6217-b8ec-499e-b780-f66ae2328380	2018-09-25 15:12:13	service <a href="#">tiab-quoteengine</a> (instance i-044271b8b06d14bc0) (port 32793) is unhealthy in target-group <a href="#">tiab-quoteengine</a> due to (reason Request timed out) +0200
6d6f4340-343d-44ce-add8-b7cb29c5a9c	2018-09-25 15:12:13	service <a href="#">tiab-quoteengine</a> has started 1 tasks: task <a href="#">86ecb87d-3ab4-413e-a990-7c1eb140c70</a> . +0200
00856b53-cb21-4d5d-8db6-fded8b13cf0b	2018-09-25 15:12:02	service <a href="#">tiab-quoteengine</a> has stopped 1 running tasks: task <a href="#">61b08129-e568-4999-b8c9-1a326d9cd4b0</a> . +0200
ab510ffa-8bb4-4a3c-8749-3a3027dd7b54	2018-09-25 15:12:02	service <a href="#">tiab-quoteengine</a> deregistered 1 targets in target-group <a href="#">tiab-quoteengine</a> +0200
27df1b9-65f4-40b0-ad33-f3b416635c5c	2018-09-25 15:12:02	service <a href="#">tiab-quoteengine</a> (instance i-00196576dae7f07ac) (port 32770) is unhealthy in target-group <a href="#">tiab-quoteengine</a> due to (reason Health checks failed) +0200
794226a5-b528-43fa-8eae-4c4765714971	2018-09-25 15:11:29	service <a href="#">tiab-quoteengine</a> registered 1 targets in target-group <a href="#">tiab-quoteengine</a> +0200
a7db380a-4a1d-418c-a7f3-ed2d98ab7f50	2018-09-25 15:11:18	service <a href="#">tiab-quoteengine</a> has started 2 tasks: task <a href="#">d5af7128-e21a-4b9e-8da5-a299f17075e2</a> task <a href="#">61b08129-e568-4999-b8c9-1a326d9cd4b0</a> . +0200
d4e7067e-cfa5-4844-9bdf-17d7bea95741	2018-09-25 15:11:08	service <a href="#">tiab-quoteengine</a> deregistered 1 targets in target-group <a href="#">tiab-quoteengine</a> +0200
fffb18ec1-4a79-4a34-abfd-abea81ba4222	2018-09-25 15:11:07	service <a href="#">tiab-quoteengine</a> has stopped 2 running tasks: task <a href="#">08305f93-cc5a-4bcb-a13f-2002e3caeed5</a> task <a href="#">e85dd5f5-5adc-4a98-b10e-5d44beb70113</a> . +0200
158faa5d-041c-4024-a313-aac5388bd713	2018-09-25 15:11:07	service <a href="#">tiab-quoteengine</a> deregistered 2 targets in target-group <a href="#">tiab-quoteengine</a> +0200
d4f4530-c868-4279-b239-09d4b18089b0	2018-09-25 15:11:07	service <a href="#">tiab-quoteengine</a> (instance i-0fc70e2c8698108c4) (port 32771) is unhealthy in target-group <a href="#">tiab-quoteengine</a> due to (reason Request timed out) +0200
c5e950c0-80cf-4529-b5d0-086a42ea1797	2018-09-25 15:11:07	service <a href="#">tiab-quoteengine</a> (instance i-00196576dae7f07ac) (port 32769) is unhealthy in target-group <a href="#">tiab-quoteengine</a> due to (reason Request timed out) +0200
6a38dd03-4a68-4b52-a78f-c59354d9d147	2018-09-25 15:10:21	service <a href="#">tiab-quoteengine</a> has reached a steady state. +0200

# Round 2 : Analyse

## Graph CPU



# Round 2 : Debug

# Round 2 : Debug

## Lancement des tests

The screenshot shows the JMeter interface with the following details:

- Toolbar:** Includes icons for file operations (New, Open, Save, Cut, Copy, Paste), a plus sign for adding elements, a minus sign for removing elements, a play button, a stop button, a scheduler icon, a results tree icon, a summary report icon, a graph results icon, a binoculars icon for monitoring, and a bell icon.
- Left Panel (Tree View):** Shows the test plan structure:
  - Neo Travel
  - Thread Group (selected)
  - Thread Group (under Neo Travel)
  - Generate Quote
  - HTTP Header Manager
  - Summary Report
  - View Results Tree
  - Aggregate Graph
  - Response Time Graph
  - Graph Results
- Right Panel (Configuration):**
  - Thread Group:**
    - Name: Thread Group
    - Comments: Action to be taken after a Sampler error
      - Continue (radio button selected)
      - Start Next Thread Loop
      - Stop Thread
      - Stop Test
      - Stop Test Now
  - Thread Properties:**
    - Number of Threads (users): 25
    - Ramp-up Period (in seconds): 0 (highlighted with a green background)
    - Loop Count:  Forever
    - Delay Thread creation until needed
    - Scheduler
  - Scheduler Configuration:**
    - Duration (seconds): 900
    - Startup delay (seconds): [empty]

# Round 2 : Debug

Visualisation des threads

## Threads

## Threads visualization

**Live threads: 72**

## Daemon threads: 16

## Thread Dump

## Timeline



**View:** All threads

1

Name		22:15:05	22:15:10	Running	Total
XNIO-2 task-16				1 001 ms (3,1 %)	32 093 ms
XNIO-2 task-21				1 002 ms (3,1 %)	32 093 ms
XNIO-2 task-20				1 009 ms (3,1 %)	32 093 ms
XNIO-2 task-19				0 ms (0 %)	32 093 ms
XNIO-2 task-18				1 003 ms (3,1 %)	32 093 ms
XNIO-2 task-17				1 004 ms (3,1 %)	32 093 ms
XNIO-2 task-15				1 001 ms (3,1 %)	32 093 ms
XNIO-2 task-10				2 011 ms (6,3 %)	32 093 ms
XNIO-2 task-14				0 ms (0 %)	32 093 ms
XNIO-2 task-13				1 004 ms (3,1 %)	32 093 ms
XNIO-2 task-12				1 005 ms (3,1 %)	32 093 ms
XNIO-2 task-11				1 005 ms (3,1 %)	32 093 ms
XNIO-2 task-8				1 010 ms (3,1 %)	32 093 ms
XNIO-2 task-9				1 002 ms (3,1 %)	32 093 ms
XNIO-2 task-5				997 ms (3,1 %)	32 093 ms
XNIO-2 task-7				1 000 ms (3,1 %)	32 093 ms
XNIO-2 task-6				1 005 ms (3,1 %)	32 093 ms
XNIO-2 task-1				1 002 ms (3,1 %)	32 093 ms

■ Running ■ Sleeping ■ Wait ■ Park ■ Monitor

# Round 2 : Debug

## Threads dump

localhost:1099 (pid 7)

Thread Dump

```
"XNIO-2 task-48" - Thread t@89
java.lang.Thread.State: BLOCKED
    at org.springframework.security.oauth2.provider.token.store.jwk.JwkDefinitionSource.getDefinitionLoadIfNecessary(JwkDefinitionSource.java:95)
    - waiting to lock <5bdd9588> (a java.util.concurrent.ConcurrentHashMap) owned by "XNIO-2 task-19" t@52
    at org.springframework.security.oauth2.provider.token.store.jwk.JwkVerifyingJwtAccessTokenConverter.decode(JwkVerifyingJwtAccessTokenConverter.java:10)
    at org.springframework.security.oauth2.provider.token.store.JwtTokenStore.readAuthentication(JwtTokenStore.java:71)
    at org.springframework.security.oauth2.provider.token.store.JwtTokenStore.readAuthentication(JwtTokenStore.java:66)
    at org.springframework.security.oauth2.provider.token.store.jwk.JwkTokenStore.readAuthentication(JwkTokenStore.java:179)
    at org.springframework.security.oauth2.provider.token.DefaultTokenServices.loadAuthentication(DefaultTokenServices.java:238)
    at org.springframework.security.oauth2.provider.token.DefaultTokenServices$$FastClassBySpringCGLIB$$5a1f25c.invoke(<generated>)
    at org.springframework.cglib.proxy.MethodProxy.invoke(MethodProxy.java:204)
    at org.springframework.aop.framework.CglibAopProxy$DynamicAdvisedInterceptor.intercept(CglibAopProxy.java:684)
    at org.springframework.security.oauth2.provider.token.DefaultTokenServices$$EnhancerBySpringCGLIB$$60f27783.loadAuthentication(<generated>)
    at org.springframework.security.oauth2.provider.authentication.OAuth2AuthenticationManager.authenticate(OAuth2AuthenticationManager.java:83)
    at org.springframework.security.oauth2.provider.authentication.OAuth2AuthenticationProcessingFilter.doFilter(OAuth2AuthenticationProcessingFilter.java)
    at org.springframework.security.web.FilterChainProxy$VirtualFilterChain.doFilter(FilterChainProxy.java:334)
    at org.springframework.security.web.authentication.logout.LogoutFilter.doFilter(LogoutFilter.java:116)
    at org.springframework.security.web.FilterChainProxy$VirtualFilterChain.doFilter(FilterChainProxy.java:334)
    at org.springframework.security.web.header.HeaderWriterFilter.doFilterInternal(HeaderWriterFilter.java:66)
    at org.springframework.web.filter.OncePerRequestFilter.doFilter(OncePerRequestFilter.java:107)
    at org.springframework.security.web.FilterChainProxy$VirtualFilterChain.doFilter(FilterChainProxy.java:334)
    at org.springframework.security.web.context.SecurityContextPersistenceFilter.doFilter(SecurityContextPersistenceFilter.java:105)
    at org.springframework.security.web.FilterChainProxy$VirtualFilterChain.doFilter(FilterChainProxy.java:334)
    at org.springframework.security.web.context.request.async.WebAsyncManagerIntegrationFilter.doFilterInternal(WebAsyncManagerIntegrationFilter.java:56)
    at org.springframework.web.filter.OncePerRequestFilter.doFilter(OncePerRequestFilter.java:107)
    at org.springframework.security.web.FilterChainProxy$VirtualFilterChain.doFilter(FilterChainProxy.java:334)
    at org.springframework.security.web.FilterChainProxy.doFilterInternal(FilterChainProxy.java:215)
    at org.springframework.security.web.FilterChainProxy.doFilter(FilterChainProxy.java:178)
    at org.springframework.web.filter.DelegatingFilterProxy.invokeDelegate(DelegatingFilterProxy.java:357)
    at org.springframework.web.filter.DelegatingFilterProxy.doFilter(DelegatingFilterProxy.java:270)
    at io.undertow.servlet.core.ManagedFilter.doFilter(ManagedFilter.java:61)
```

# Round 2: Debug

## Code source

```
JwkDefinitionHolder getDefinitionLoadIfNecessary(String keyId) {  
    JwkDefinitionHolder result = this.getDefinition(keyId);  
    if (result != null) {  
        return result;  
    }  
    synchronized (this.jwkDefinitions) {  
        this.jwkDefinitions.clear();  
        for (URL jwkSetUrl : jwkSetUrls) {  
            this.jwkDefinitions.putAll(loadJwkDefinitions(jwkSetUrl))  
        }  
        return this.getDefinition(keyId);  
    }  
}
```

# Round 2 : Debug

## Résolution

```
JwkDefinitionHolder getDefinitionLoadIfNecessary(String keyId) {
    JwkDefinitionHolder result = this.getDefinition(keyId);
    if (result != null) {
        return result;
    }
    synchronized (this.jwkDefinitions) {

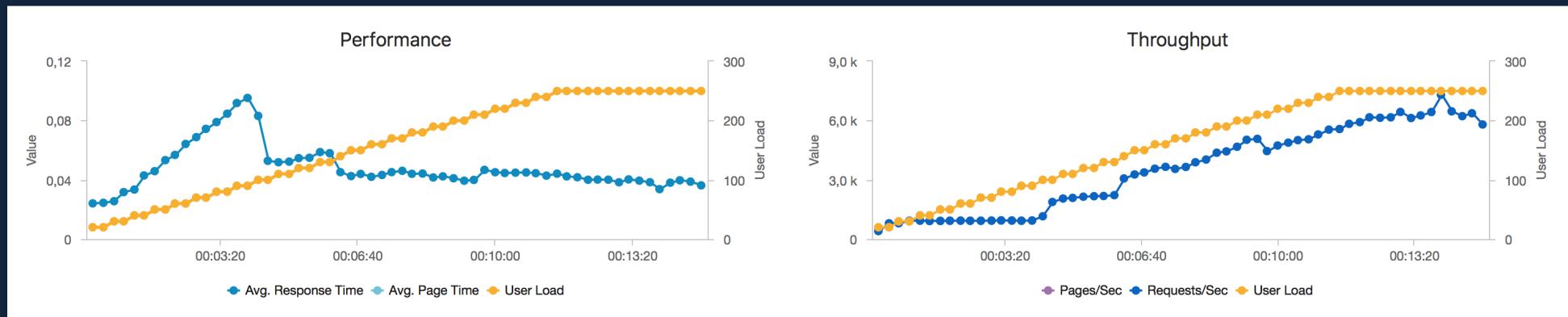
        // Double-checked locking pattern
        result = this.getDefinition(keyId);
        if (result != null) {
            return result;
        }

        this.jwkDefinitions.clear();
        for (URL jwkSetUrl : jwkSetUrls) {
            this.jwkDefinitions.putAll(loadJwkDefinitions(jwkSetUrl))
        }
    }
}
```

# Round 2 : Tests

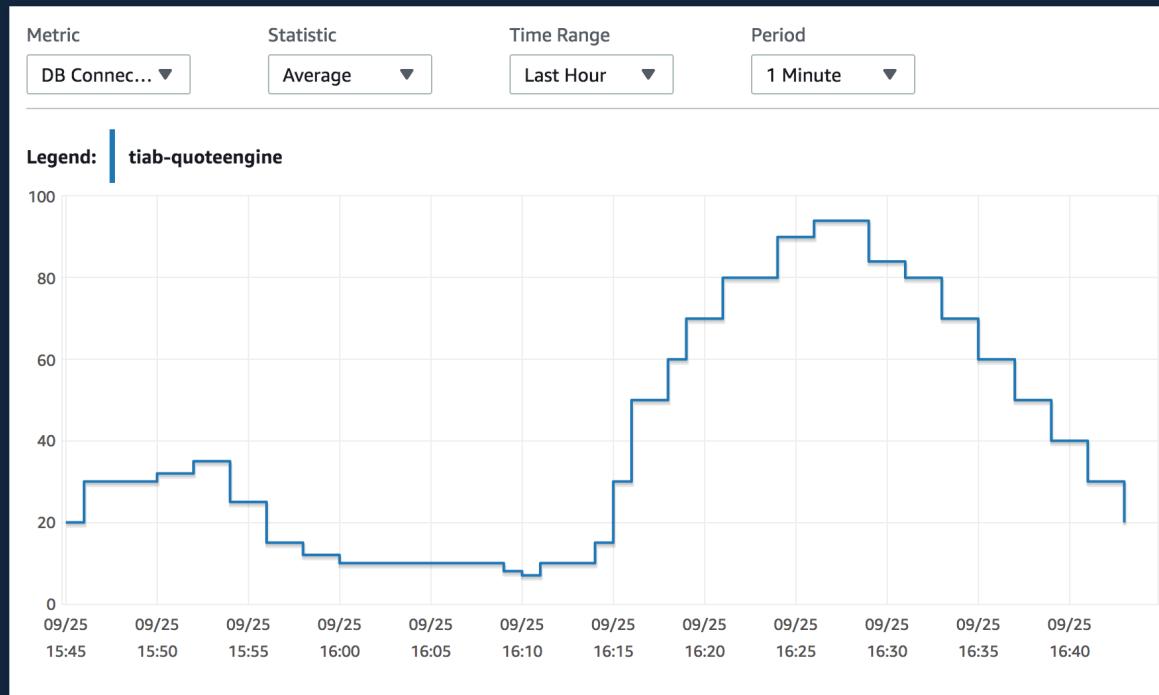
# Round 2 : Résultats

Race condition résolue



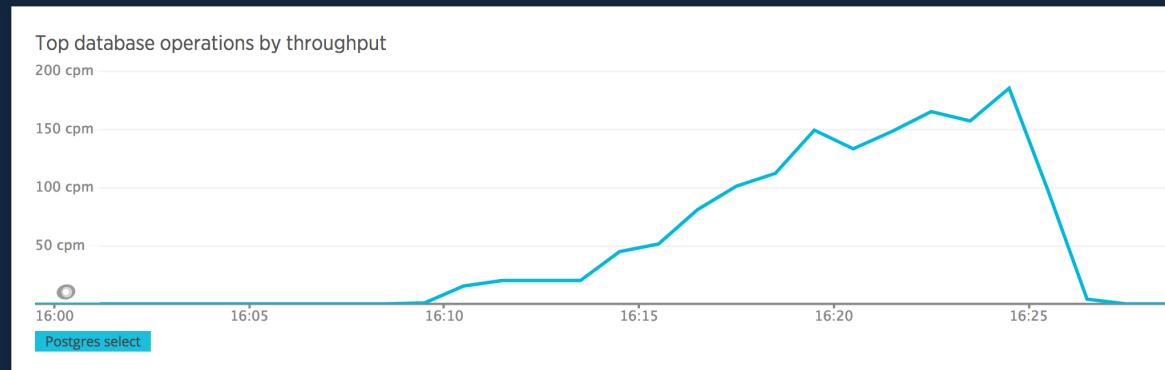
# Round 3 : Analyse

## Connection DB



# Round 3 : Analyse

## Requetes DB



# Round 3 : Debug

# Round 3 : Debug

## Activation logs

```
logging:  
  level:  
    org.springframework.jdbc.core: TRACE
```

# Round 3 : Debug

## Logs Spring JDBC

```
2019-03-20 22:34:49.891 DEBUG 36665 --- [ XNIO-2 task-1] o.s.jdbc.core.JdbcTemplate
2019-03-20 22:34:49.891 DEBUG 36665 --- [ XNIO-2 task-1] o.s.jdbc.core.JdbcTemplate
2019-03-20 22:34:49.891 TRACE 36665 --- [ XNIO-2 task-1] o.s.jdbc.core.StatementCreatorUtils
2019-03-20 22:34:49.893 DEBUG 36665 --- [ XNIO-2 task-1] o.s.jdbc.core.BeanPropertyRowMapper
2019-03-20 22:34:49.894 DEBUG 36665 --- [ XNIO-2 task-1] o.s.jdbc.core.BeanPropertyRowMapper
2019-03-20 22:34:49.894 DEBUG 36665 --- [ XNIO-2 task-1] o.s.jdbc.core.BeanPropertyRowMapper
2019-03-20 22:34:49.895 DEBUG 36665 --- [ XNIO-2 task-1] o.s.jdbc.core.BeanPropertyRowMapper
2019-03-20 22:34:49.902 DEBUG 36665 --- [ XNIO-2 task-1] o.s.jdbc.core.JdbcTemplate
2019-03-20 22:34:49.902 DEBUG 36665 --- [ XNIO-2 task-1] o.s.jdbc.core.JdbcTemplate
2019-03-20 22:34:49.902 TRACE 36665 --- [ XNIO-2 task-1] o.s.jdbc.core.StatementCreatorUtils
2019-03-20 22:34:49.904 DEBUG 36665 --- [ XNIO-2 task-1] o.s.jdbc.core.BeanPropertyRowMapper
2019-03-20 22:34:49.904 DEBUG 36665 --- [ XNIO-2 task-1] o.s.jdbc.core.BeanPropertyRowMapper
2019-03-20 22:34:49.905 DEBUG 36665 --- [ XNIO-2 task-1] o.s.jdbc.core.BeanPropertyRowMapper
: Executing prepared SQL query
: Executing prepared SQL statement [select co.code as countryCode, gc.code as classCode, o
: Setting SQL statement parameter value: column index 1, parameter value [FR], value clas
: Mapping column 'countrycode' to property 'countryCode' of type 'java.lang.String'
: Mapping column 'classcode' to property 'classCode' of type 'java.lang.String'
: Mapping column 'value' to property 'value' of type 'java.math.BigDecimal'
: Executing prepared SQL query
: Executing prepared SQL statement [select s.code as sourceCurrency, e.code as targetCurre
: Setting SQL statement parameter value: column index 1, parameter value [EUR], value clas
: Mapping column 'sourcecurrency' to property 'sourceCurrency' of type 'java.lang.String'
: Mapping column 'targetcurrency' to property 'targetCurrency' of type 'java.lang.String'
: Mapping column 'rate' to property 'rate' of type 'java.math.BigDecimal'
```

# Round 3 : Debug

## Activation logs Driver

```
logging:  
  level:  
    org.postgresql.core.v3.QueryExecutorImpl: TRACE
```

# Round 3 : Debug

## Logs Driver Postgresql

```
2019-03-20 22:37:12.187 TRACE 36674 --- [ XNIO-2 task-2] o.postgresql.core.v3.QueryExecutorImpl : FE=> Bind(stmt=null,portal=null)
2019-03-20 22:37:12.187 TRACE 36674 --- [ XNIO-2 task-2] o.postgresql.core.v3.QueryExecutorImpl : FE=> Describe(portal=null)
2019-03-20 22:37:12.187 TRACE 36674 --- [ XNIO-2 task-2] o.postgresql.core.v3.QueryExecutorImpl : FE=> Execute(portal=null,limit=1)
2019-03-20 22:37:12.187 TRACE 36674 --- [ XNIO-2 task-2] o.postgresql.core.v3.QueryExecutorImpl : FE=> Sync
2019-03-20 22:37:12.189 TRACE 36674 --- [ XNIO-2 task-2] o.postgresql.core.v3.QueryExecutorImpl : <=BE ParseComplete [null]
2019-03-20 22:37:12.189 TRACE 36674 --- [ XNIO-2 task-2] o.postgresql.core.v3.QueryExecutorImpl : <=BE BindComplete [unnamed]
2019-03-20 22:37:12.189 TRACE 36674 --- [ XNIO-2 task-2] o.postgresql.core.v3.QueryExecutorImpl : <=BE NoData
2019-03-20 22:37:12.189 TRACE 36674 --- [ XNIO-2 task-2] o.postgresql.core.v3.QueryExecutorImpl : <=BE EmptyQuery
2019-03-20 22:37:12.189 TRACE 36674 --- [ XNIO-2 task-2] o.postgresql.core.v3.QueryExecutorImpl : <=BE ReadyForQuery(I)
2019-03-20 22:37:16.071 TRACE 36674 --- [ XNIO-2 task-3] o.postgresql.core.v3.QueryExecutorImpl : simple execute, handler=org.postgresql.jdbc.PgStatement$StatementResultHandler@44b63fb
2019-03-20 22:37:16.071 TRACE 36674 --- [ XNIO-2 task-3] o.postgresql.core.v3.QueryExecutorImpl : FE=> Parse(stmt=S_12,query="",oids={})
2019-03-20 22:37:16.071 TRACE 36674 --- [ XNIO-2 task-3] o.postgresql.core.v3.QueryExecutorImpl : FE=> Bind(stmt=S_12,portal=null)
2019-03-20 22:37:16.071 TRACE 36674 --- [ XNIO-2 task-3] o.postgresql.core.v3.QueryExecutorImpl : FE=> Describe(portal=null)
2019-03-20 22:37:16.071 TRACE 36674 --- [ XNIO-2 task-3] o.postgresql.core.v3.QueryExecutorImpl : FE=> Execute(portal=null,limit=1)
2019-03-20 22:37:16.071 TRACE 36674 --- [ XNIO-2 task-3] o.postgresql.core.v3.QueryExecutorImpl : FE=> Sync
2019-03-20 22:37:16.073 TRACE 36674 --- [ XNIO-2 task-3] o.postgresql.core.v3.QueryExecutorImpl : <=BE ParseComplete [S_12]
2019-03-20 22:37:16.073 TRACE 36674 --- [ XNIO-2 task-3] o.postgresql.core.v3.QueryExecutorImpl : <=BE BindComplete [unnamed]
2019-03-20 22:37:16.073 TRACE 36674 --- [ XNIO-2 task-3] o.postgresql.core.v3.QueryExecutorImpl : <=BE NoData
2019-03-20 22:37:16.073 TRACE 36674 --- [ XNIO-2 task-3] o.postgresql.core.v3.QueryExecutorImpl : <=BE EmptyQuery
2019-03-20 22:37:16.073 TRACE 36674 --- [ XNIO-2 task-3] o.postgresql.core.v3.QueryExecutorImpl : <=BE ReadyForQuery(I)
```

# Round 3 : Debug

## Break point driver Posgresql

The screenshot shows a Java application running in a debugger. The code editor at the top displays a method named `execute` from the `QueryExecutorImpl` class. A break point is set on line 275, which contains the condition `if (LOGGER.isLoggable(Level.FINEST))`. The code is annotated with green text indicating the flow of execution: `simple execute, handler={0}, maxRows={1}, fetchSize={2}, flags={3}`. The debugger tool window below the code editor shows the current thread stack trace, which includes various PostgreSQL JDBC methods like `execute`, `executeWithFlags`, and `executeUpdate`, along with Spring framework methods such as `doBegin`, `getTransaction`, and `createTransactionIfNecessary`. The variable viewer on the right side of the debugger shows local variables: `this` (a `QueryExecutorImpl` instance), `query` (a `SimpleQuery` object), `parameters` (a `SimpleParameterList` object), `handler` (a `PgStatement$StatementResultHandler` object), `maxRows` (0), `fetchSize` (0), and `flags` (20). The line number 275 is highlighted in yellow.

```
public synchronized void execute(Query query, ParameterList parameters, ResultHandler handler, query:  
    int maxRows, int fetchSize, int flags) throws SQLException { maxRows: 0 fetchSize: 0 flags: 20  
    waitOnLock();  
    if (LOGGER.isLoggable(Level.FINEST)) {  
        LOGGER.log(Level.FINEST, msg: " simple execute, handler={0}, maxRows={1}, fetchSize={2}, flags={3}",  
        new Object[]{handler, maxRows, fetchSize, flags});  
    }  
}  
QueryExecutorImpl > execute()
```

Debug: Application

Debugger | Console | Endpoints | Frames | Threads | Variables

"XNIO-2 task-5"@9,085 in group "main": RUNNING

- execute:365, PgStatement (org.postgresql.jdbc)
- executeWithFlags:150, PgPreparedStatement (org.postgresql.jdbc)
- executeUpdate:127, PgPreparedStatement (org.postgresql.jdbc)
- isValid:1381, PgConnection (org.postgresql.jdbc)
- isConnectionAlive:150, PoolBase (com.zaxxer.hikari.pool)
- getConnection:172, HikariPool (com.zaxxer.hikari.pool)
- getConnection:148, HikariPool (com.zaxxer.hikari.pool)
- getConnection:128, HikariDataSource (com.zaxxer.hikari)
- doBegin:262, DataSourceTransactionManager (org.springframework.jdbc.datasource)
- getTransaction:378, AbstractPlatformTransactionManager (org.springframework.transaction.support)
- createTransactionIfNecessary:474, TransactionAspectSupport (org.springframework.transaction.interceptor)
- invokeWithinTransaction:289, TransactionAspectSupport (org.springframework.transaction.interceptor)
- invoke:98, TransactionInterceptor (org.springframework.transaction.interceptor)
- proceed:185, ReflectiveMethodInvocation (org.springframework.aop.framework)
- intercept:688, CglibAopProxy\$DynamicAdvisedInterceptor (org.springframework.aop.framework)
- getGlobalTaxes:-1, TaxeService\$\$EnhancerBySpringCGLIB\$\$3c120c70 (com.vanroy.tiab.quoteengine.service.pricing)
- getGlobalTaxes:272, QuotingService (com.vanroy.tiab.quoteengine.service)
- compute:112, QuotingService (com.vanroy.tiab.quoteengine.service)
- quote:56, QuotingApi (com.vanroy.tiab.quoteengine.api)

Variables

- this = {QueryExecutorImpl@8935}
- query = {SimpleQuery@8937} ""
- parameters = {SimpleParameterList@8938} "<[]>"
- handler = {PgStatement\$StatementResultHandler@9088}
- maxRows = 0
- fetchSize = 0
- flags = 20

# Round 3 : Debug

## Résolution

```
@Service
@Transactional
@RequiredArgsConstructor
public class TaxService {

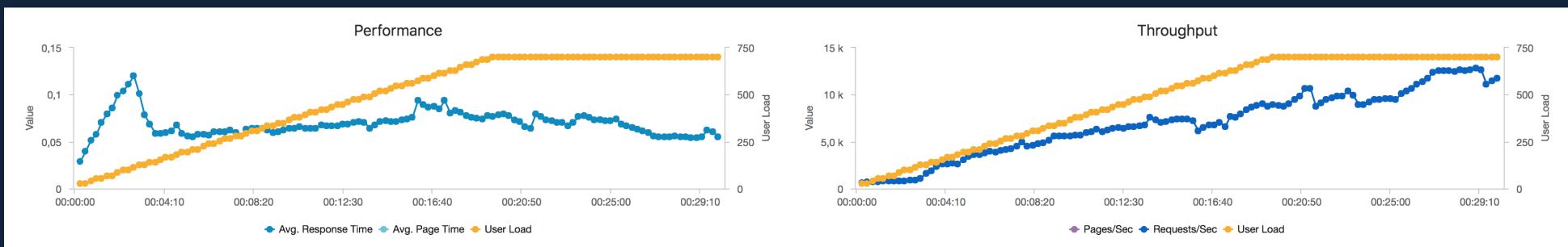
    private final CacheManager cacheManager;

    public List<GlobalTax> getGlobalTaxes(String countryCode) {
        return Optional.ofNullable(getGlobalTaxCache().get(countryCode))
    }

    private Cache getGlobalTaxCache() {
        return cacheManager.getCache(CacheConfiguration.GLOBAL_TAX_CACHE)
    }
}
```

# Round 3 : Résultats

## Gestion du cache améliorée



# La suite

# La suite

- Tests de performance intégré au pipeline de déploiement

# La suite

- Tests de performance intégré au pipeline de déploiement
- Amélioration autoscaling ( basé sur les temps de réponses ? )

# Points clés

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- Environment stable ( ISO prod )

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- Mesures reproductibles ( jeux de données )

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- Métriques complètes
- Une seule modification à la fois

# Points clés

- Environnement stable ( ISO prod )
- Mesures reproductibles ( jeux de données )
- Métriques complètes
- Une seule modification à la fois
- Reproduction en local ( Si possible )



Questions

**JAVA IS AWESOME**