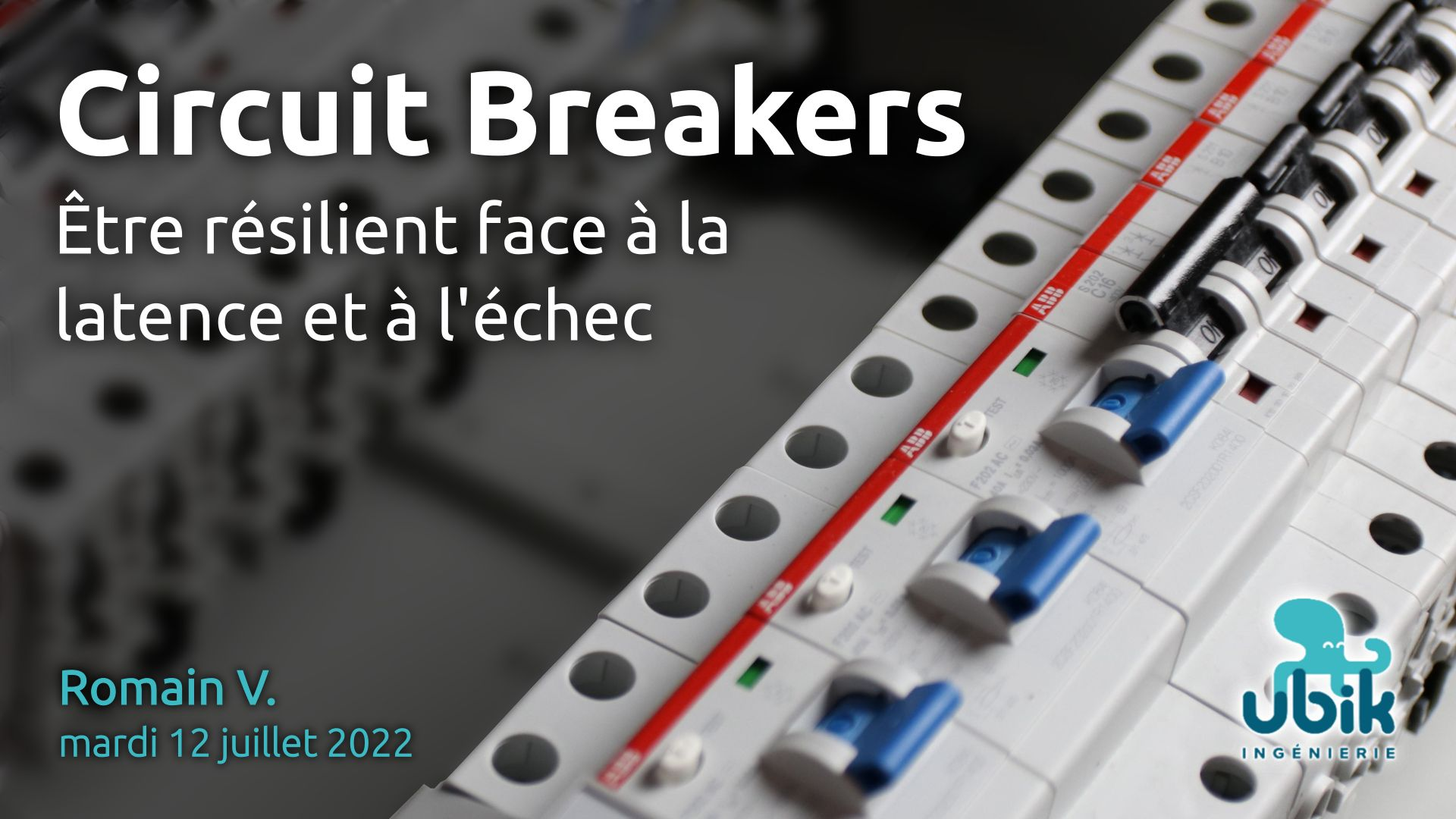
Circuit Breakers

Être résilient face à la latence et à l'échec



Romain V.

mardi 12 juillet 2022

ubik INGÉNIERIE

Qui suis-je

Romain V.
Chez Ubik Ingénierie depuis septembre 2021
Développeur Java - Angular
Projets pour différents clients

Plan

Design pattern

Resilience4j

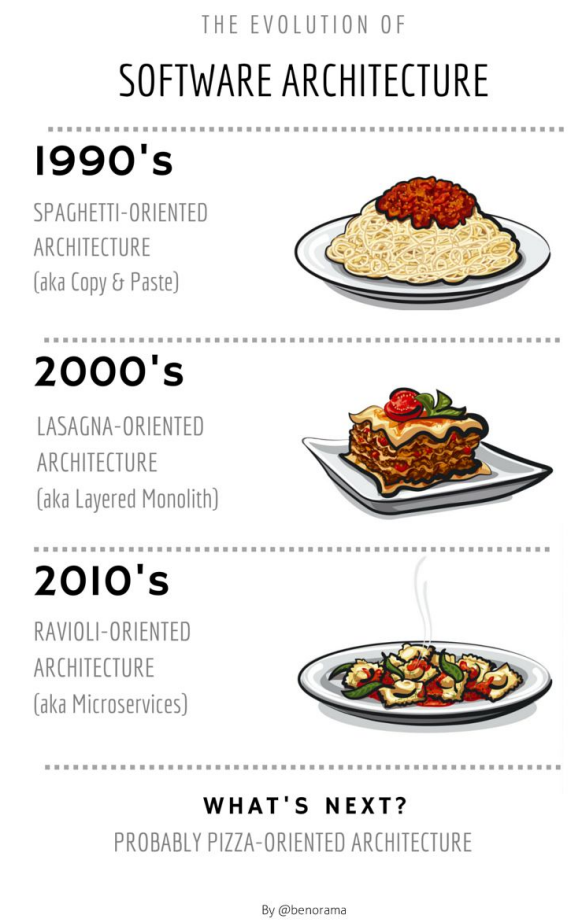
Configuration

Exemple d’utilisation

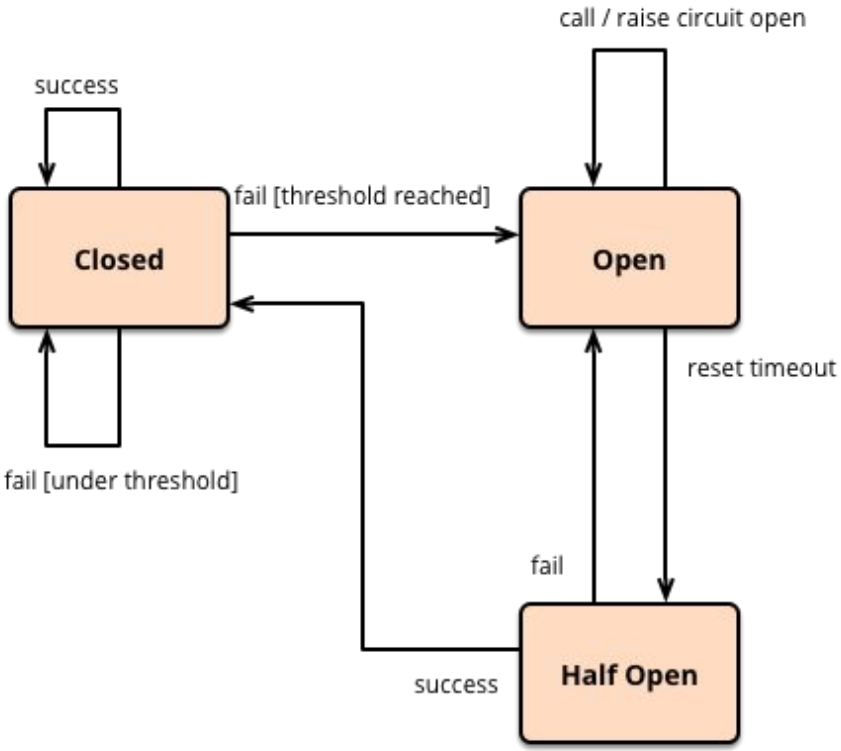
Des questions ?
Prenez-note ✏ :

Design pattern

De nouvelles problématiques



Design pattern

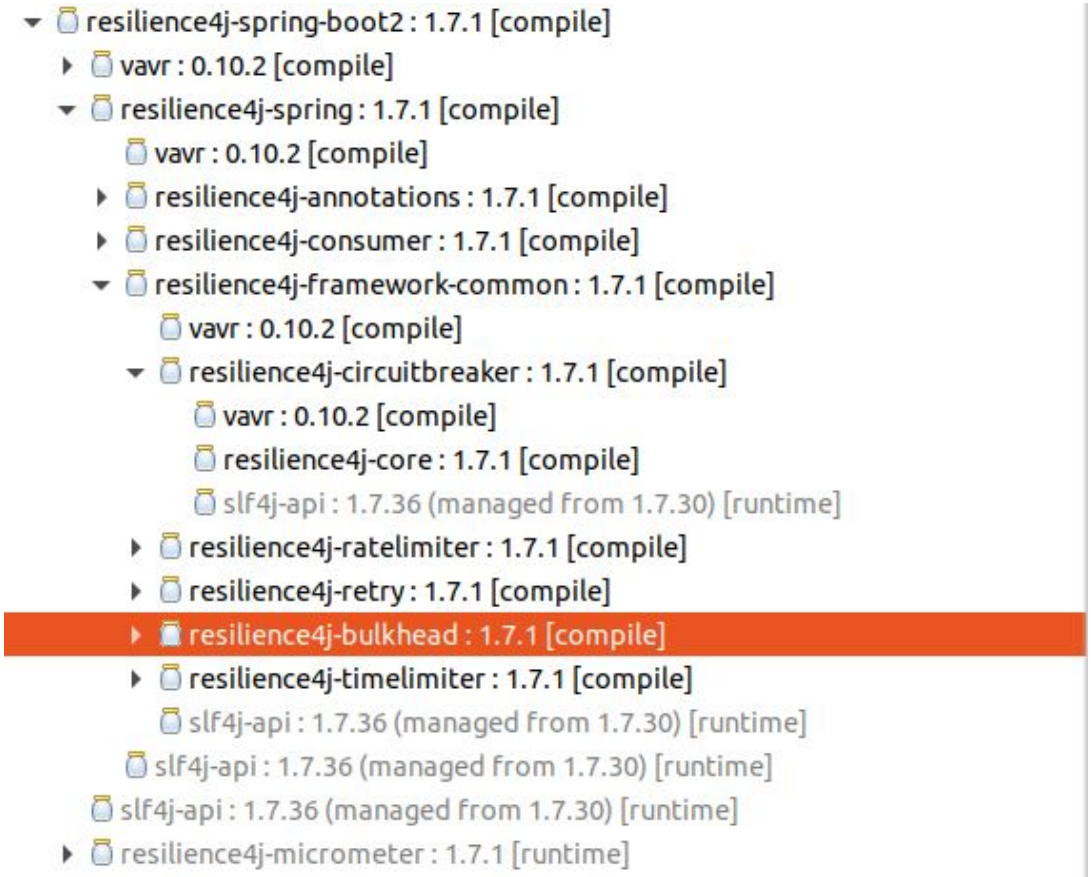


Resilience4j

Utilisation avec spring

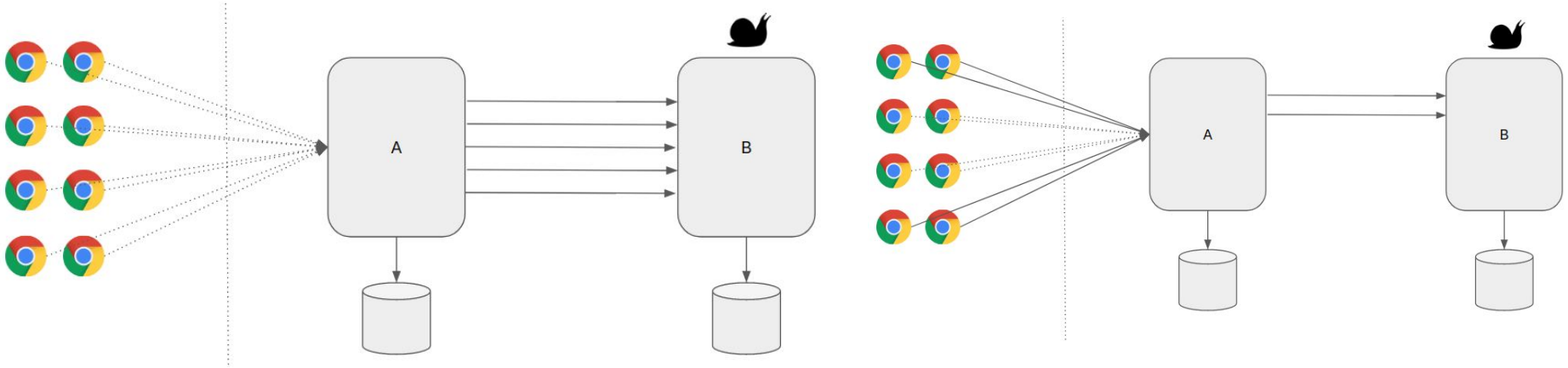
- io.github.resilience4j:resilience4j-spring-boot2
- org.springframework.boot:spring-boot-starter-actuator
- org.springframework.boot:spring-boot-starter-aop

Les dépendances de resilience4j



Bulkhead

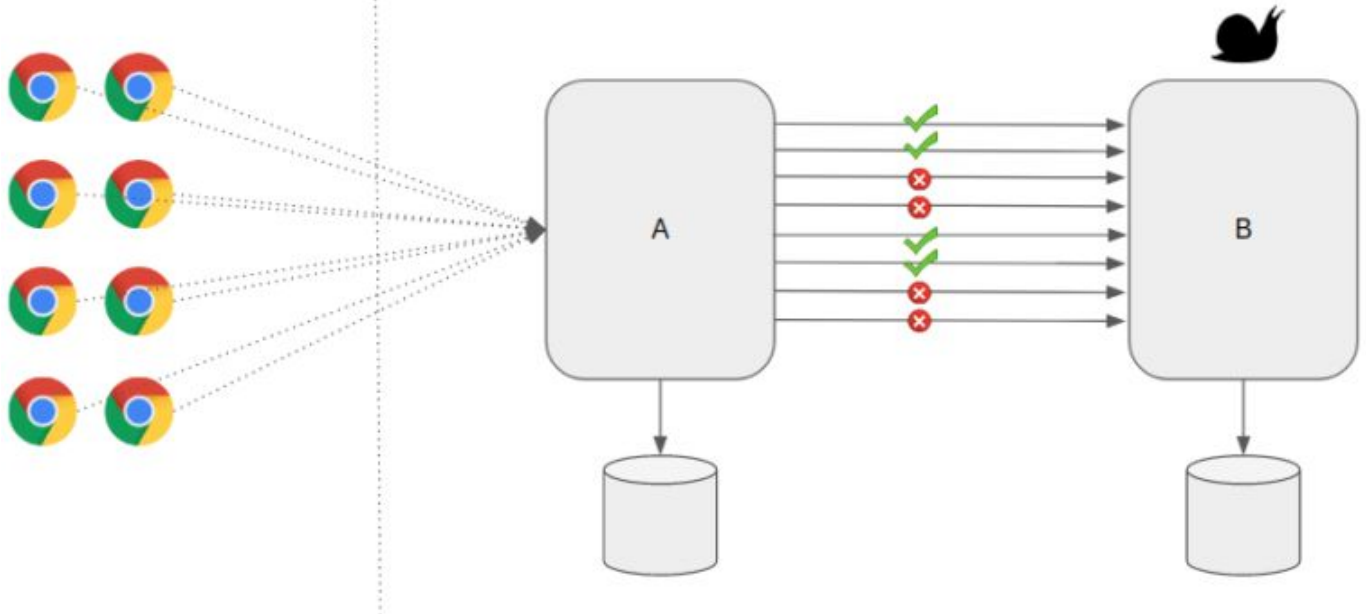
A droite, on a limité à 2 appels concurrents de B (qui est lent) pour éviter de saturer les threads de traitement de B qui est limité en ressources



Annotation resilience4j : @Bulkhead(name=BULKHEAD_NAME)

Ratelimiter

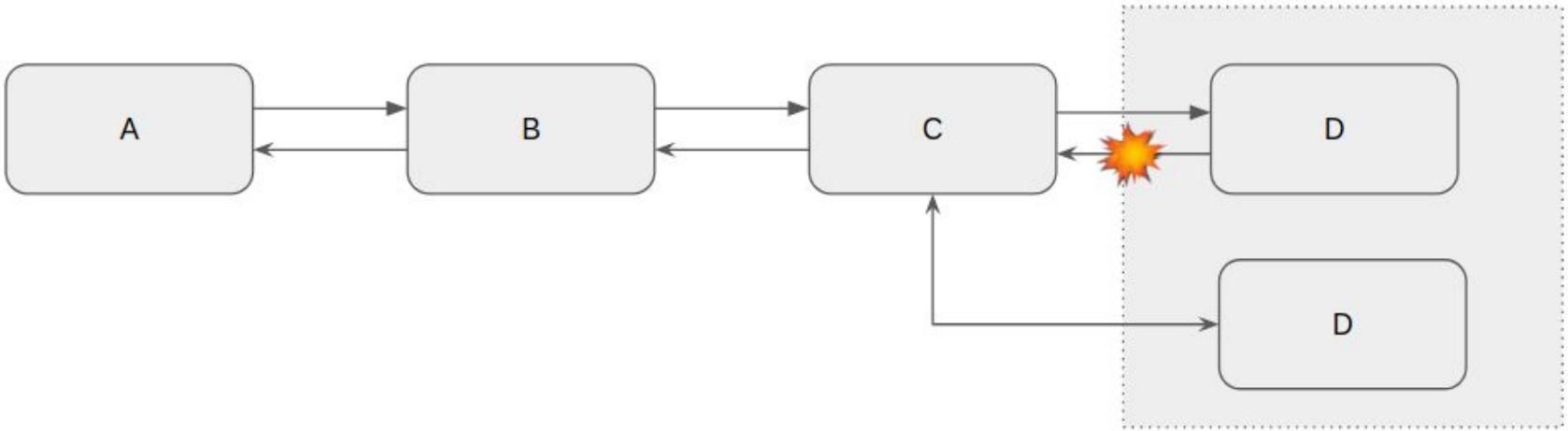
B ne pouvant encaisser plus de X appels sur une durée, on va limiter le nombre d'appels sur une période donnée et rejeter les autres appels plutôt que les traiter et crasher



Annotation resilience4j : @RateLimiter(name=RATELIMITER_NAME)

Retry

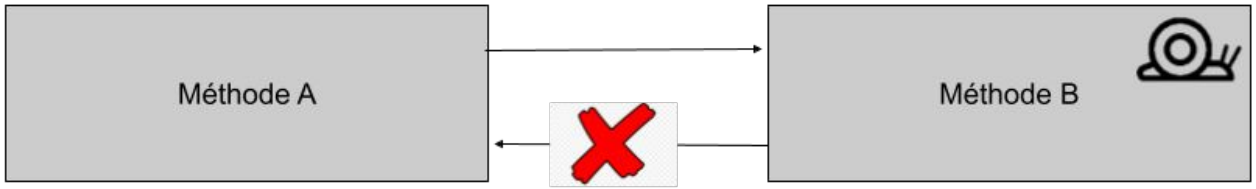
Le premier appel à B a échoué et le second a renvoyé un succès



Annotation resilience4j : @Retry(name=RETRY_NAME)

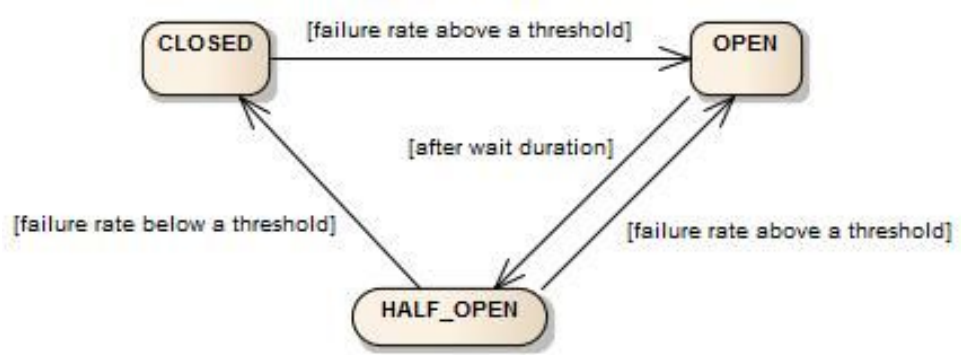
Timelimiter

La méthode B a mis trop de temps à renvoyer un résultat



Annotation resilience4j : @Timelimiter(name=TIMELIMITER_NAME)

Circuit breaker



Gérer la latence et les échecs des webservices utilisés par votre application

Annotation resilience4j : @CircuitBreaker(name=CIRCUIT_BREAKER_NAME)

Configuration

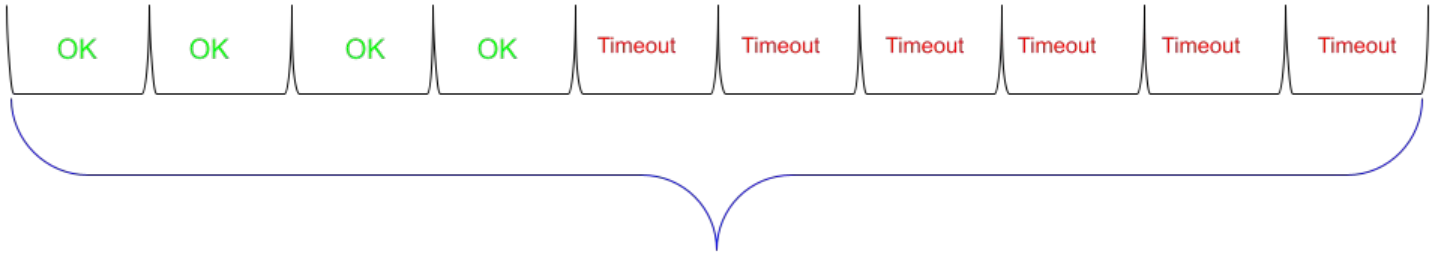
Configuration commune à l'ensemble des circuit breakers

```
resilience4j.circuitbreaker.configs.default.slidingWindowSize=5
resilience4j.circuitbreaker.configs.default.slowCallRateThreshold=60
resilience4j.circuitbreaker.configs.default.slowCallDurationThreshold=1500
resilience4j.circuitbreaker.configs.default.minimumNumberOfCalls=2
resilience4j.circuitbreaker.configs.default.permittedNumberOfCallsInHalfOpenState=1
```

Configuration spécifique à un circuit breaker

```
resilience4j.circuitbreaker.instances.pricebreaker.baseConfig=default
resilience4j.circuitbreaker.instances.pricebreaker.slidingWindowSize=10
resilience4j.circuitbreaker.instances.pricebreaker.slowCallRateThreshold=80
resilience4j.circuitbreaker.instances.pricebreaker.slowCallDurationThreshold=1000
resilience4j.circuitbreaker.instances.pricebreaker.minimumNumberOfCalls=5
resilience4j.circuitbreaker.instances.pricebreaker.permittedNumberOfCallsInHalfOpenState=2
resilience4j.circuitbreaker.instances.pricebreaker.recordExceptions[0]=myapp.service.common.CustomException
resilience4j.circuitbreaker.instances.pricebreaker.recordExceptions[1]=org.springframework.web.client.RestClientException
```

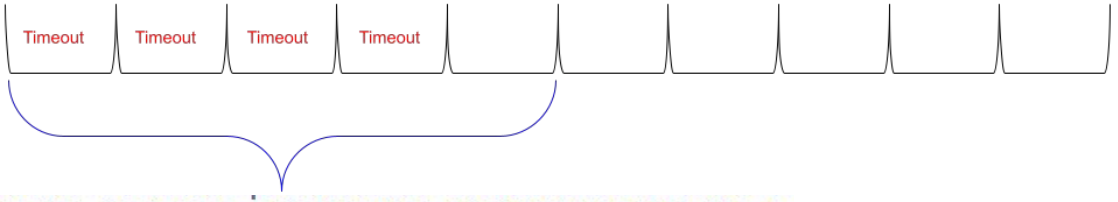
slidingWindowSize




```
resilience4j.circuitbreaker.instances.pricebreaker.slidingWindowSize=10
```

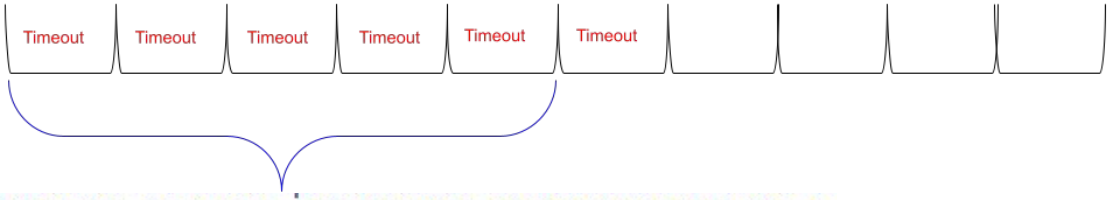
minimumNumberOfCalls

Le circuit breaker n'est pas opérationnel



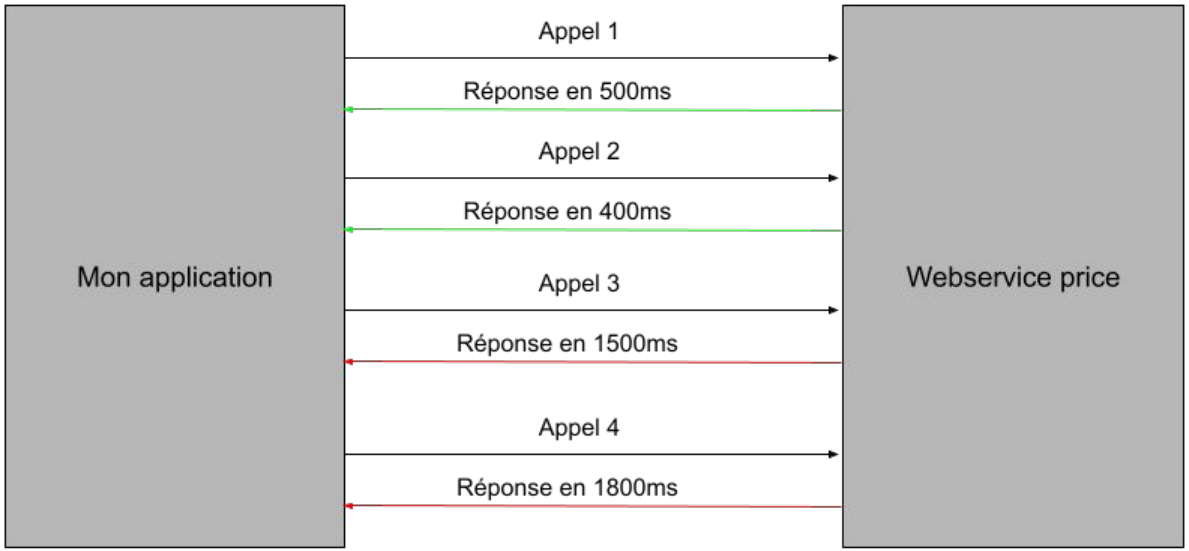

```
resilience4j.circuitbreaker.instances.pricebreaker.minimumNumberOfCalls=5
```

Le circuit breaker est opérationnel




```
resilience4j.circuitbreaker.instances.pricebreaker.minimumNumberOfCalls=5
```

slowCallDurationThreshold

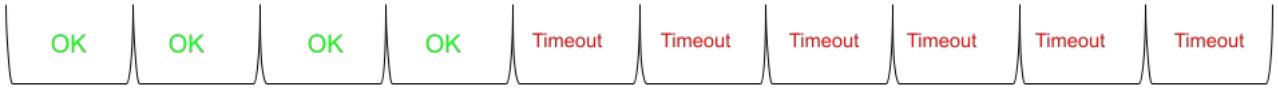



```
resilience4j.circuitbreaker.instances.pricebreaker.slowCallDurationThreshold=1000
```

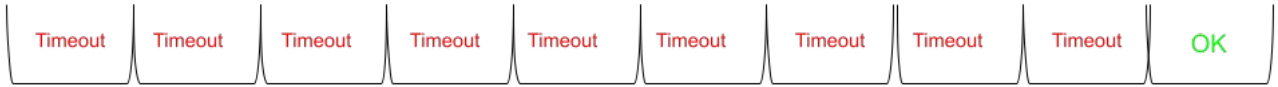
slowCallRateThreshold

```
resilience4j.circuitbreaker.instances.pricebreaker.slowCallRateThreshold=80
```

Le circuit breaker reste dans l'état CLOSED

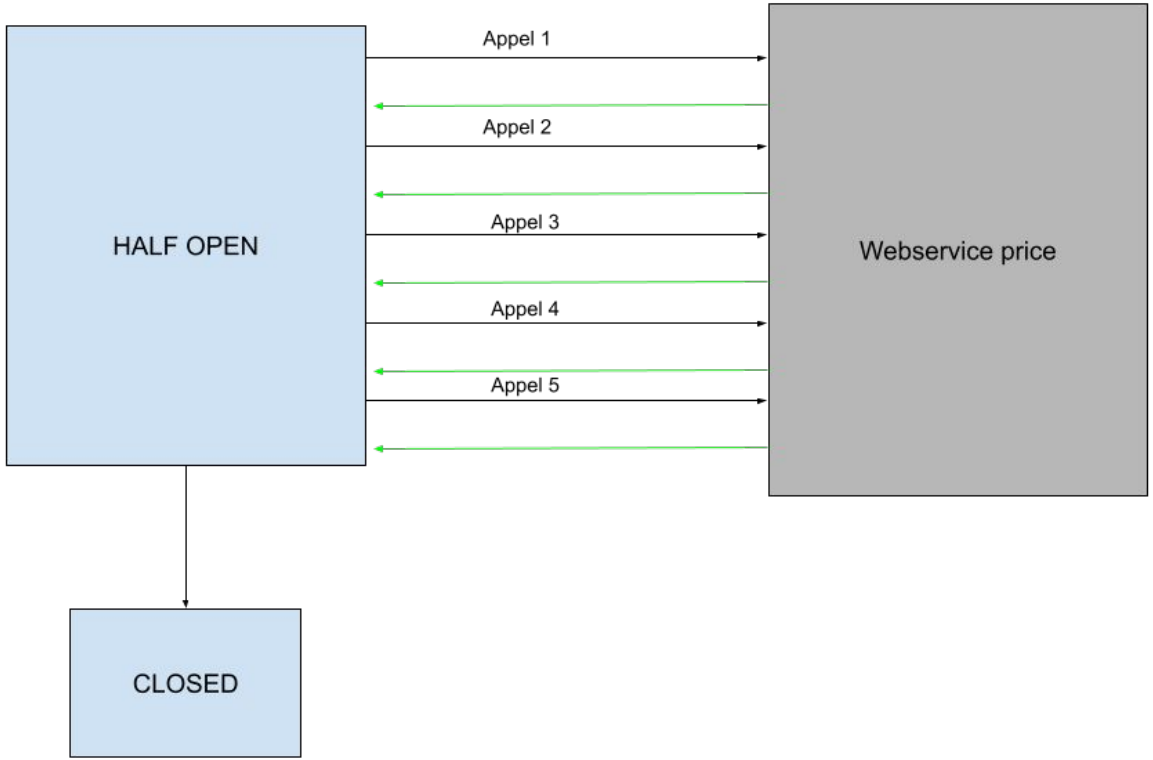


Le circuit breaker passe en OPEN

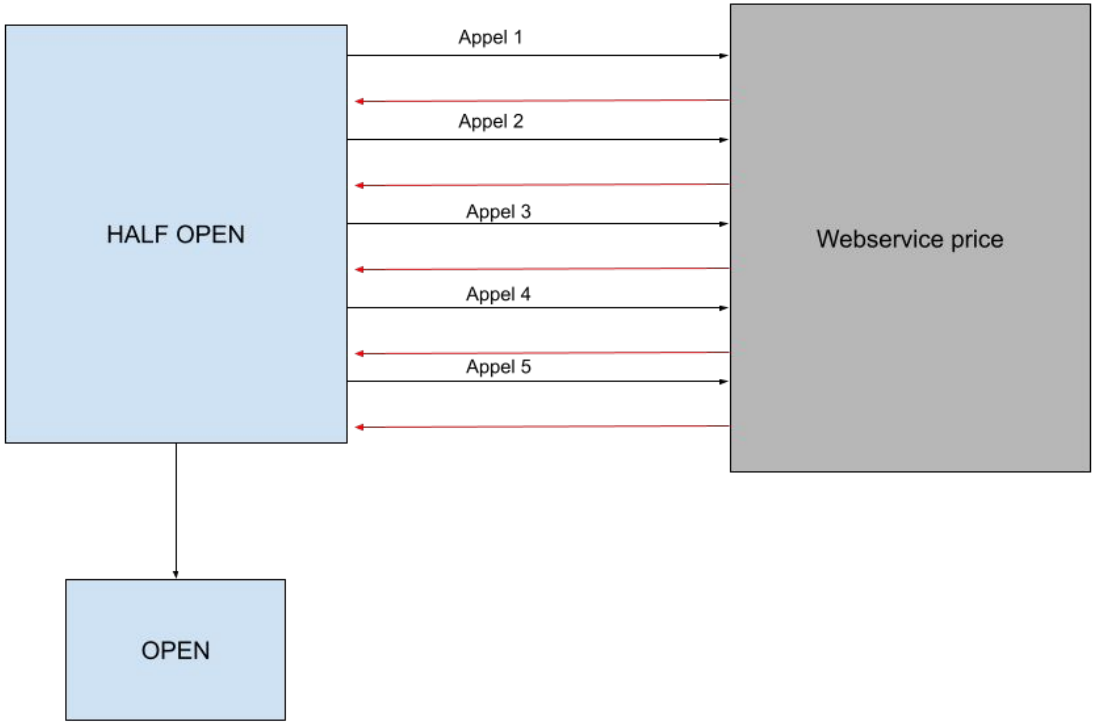


permittedNumberOfCallsInHalfOpenState

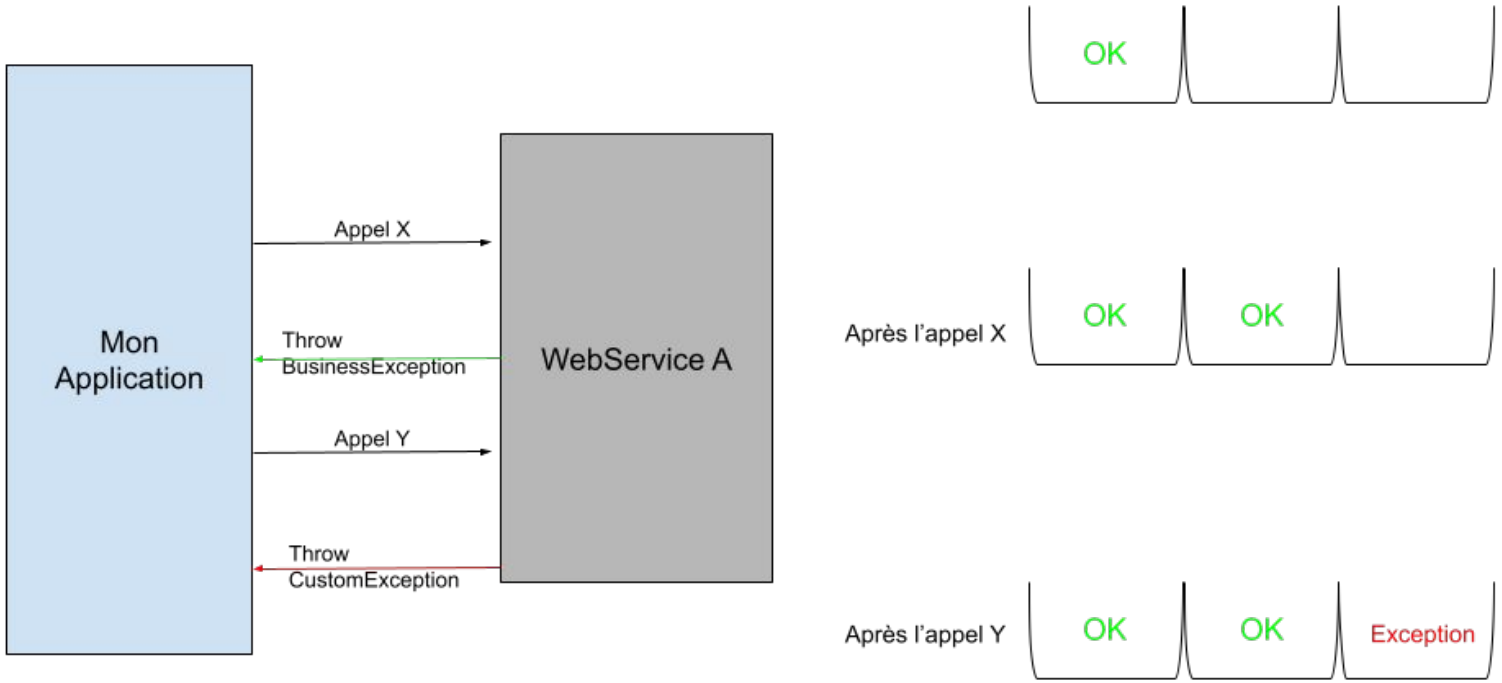
```
resilience4j.circuitbreaker.instances.pricebreaker.minimumNumberOfCalls=5
```



permittedNumberOfCallsInHalfOpenState



recordExceptions[i]




```
resilience4j.circuitbreaker.instances.pricebreaker.recordExceptions[0]=myapp.service.common.CustomException
resilience4j.circuitbreaker.instances.pricebreaker.recordExceptions[1]=org.springframework.web.client.RestClientException
```

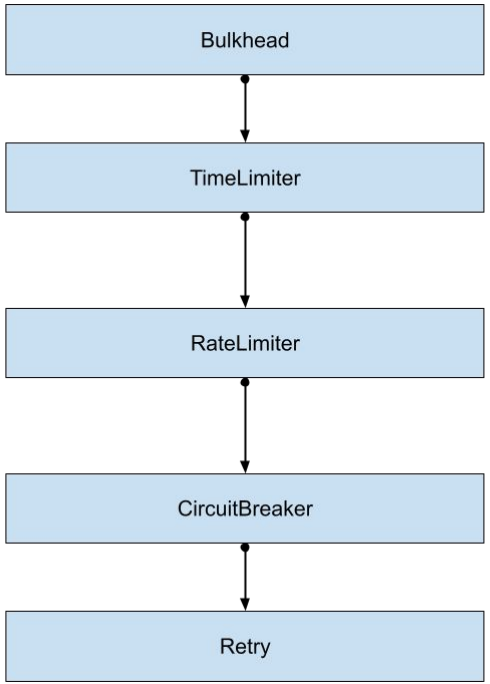
Ensemble des propriétés disponibles

- https://resilience4j.readme.io/docs/circuitbreaker

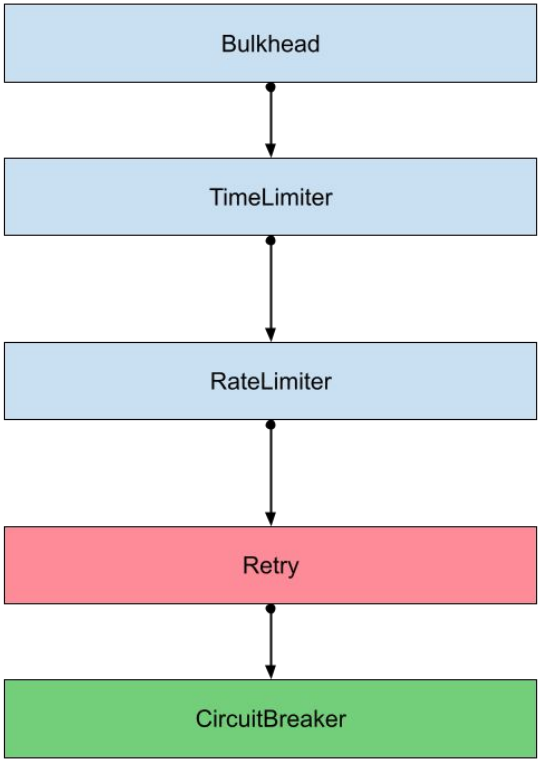
Ordre décorateur

```
@CircuitBreaker(name = "CircuitBreakerServiceA")
@RateLimiter(name = "RateLimiterServiceA")
@Bulkhead(name = "BulkheadServiceA")
@Retry(name = "RetryServiceA")
@TimeLimiter(name = "TimeLimiteServiceA")
public void method(String param1, int param2) {

}
```



Modification ordre décorateur




```
resilience4j.circuitbreaker.circuitBreakerAspectOrder=1
resilience4j.retry.retryAspectOrder=2
```

Exemple d’utilisation

Exemple circuit breaker (catch exception)

```
@Retry(name = Resilience.RETRY_NAME_FOR_API)
@CircuitBreaker(name = Resilience.CIRCUIT_BREAKER_NAME_FOR_API)
public Response callApi() throws CallNotPermittedException {
    // Imagine some serious job here!
}


try {
    service.callApi();
} catch (CallNotPermittedException e) {
    return new FallbackResponse();
}
```

Exemple circuit breaker (fallback method)

```
@CircuitBreaker(name = Resilience.CIRCUIT_BREAKER_NAME_FOR_API,
                fallbackMethod = "fallbackResponse")
public Response callApi(Some signature) {
    // Imagine some serious job here!
}


private void fallbackResponse(Some sameSignature,
                              CallNotPermittedException e) {
    return new FallbackResponse();
}
```


Questions