

Smooth Sailing

How RedHat Service Mesh kept
our ship afloat



Who is Who

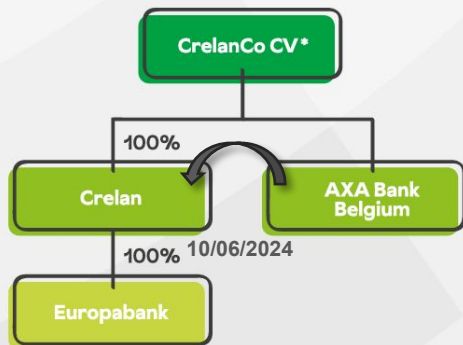


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Domain Lead Digital
Banking



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Head of Tech. &
Innovation

Simplified overview of the structure of the Crelan Group



*NV Crelan and the official cooperative company, CV CrelanCo, together form a federation of credit institutions, with NV Crelan as its central institution. In accordance with Article 239 of the Act of 25 April 2014 on the status and supervision of credit institutions



2.568

Employees



472

Agencies



271.363

Shareholders



949.867

Customers



crelan x2



4.536

Employees



792

Agencies



283.629

Shareholders



1.798.373

Customers

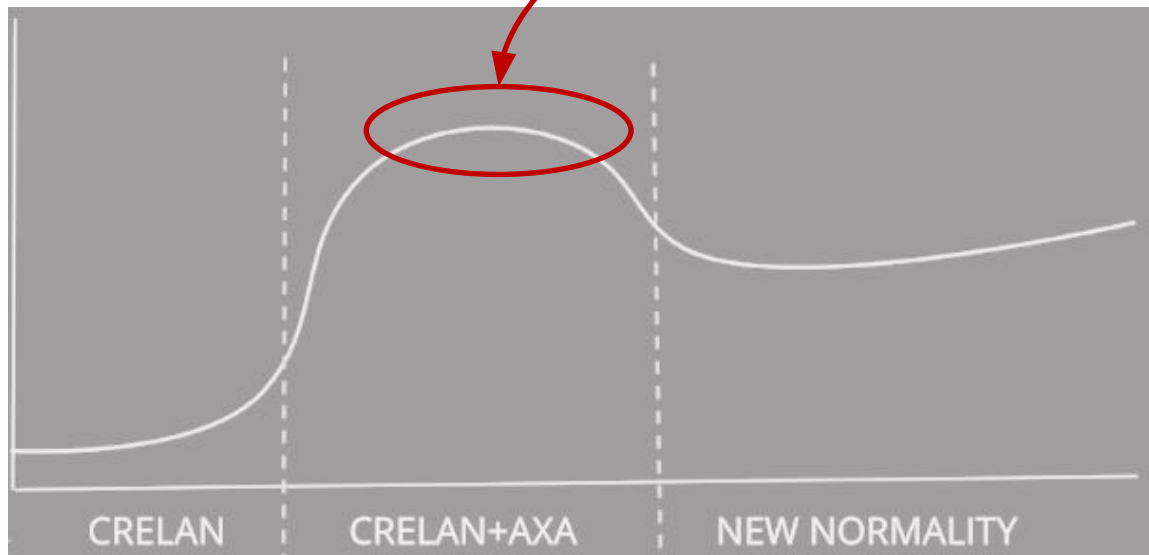
Crelan
the 5th largest bank
of Belgium,
by acquisition of
AXA Bank Belgium.

*based on figures of
31/12/2023*



Two banks merging

- A new wave of users, services are hitting the Crelan's platform in June 2024.
- Dynamically scaling to cope with this unpredictable influx of traffic is not an option due to link with on-premise.



1x



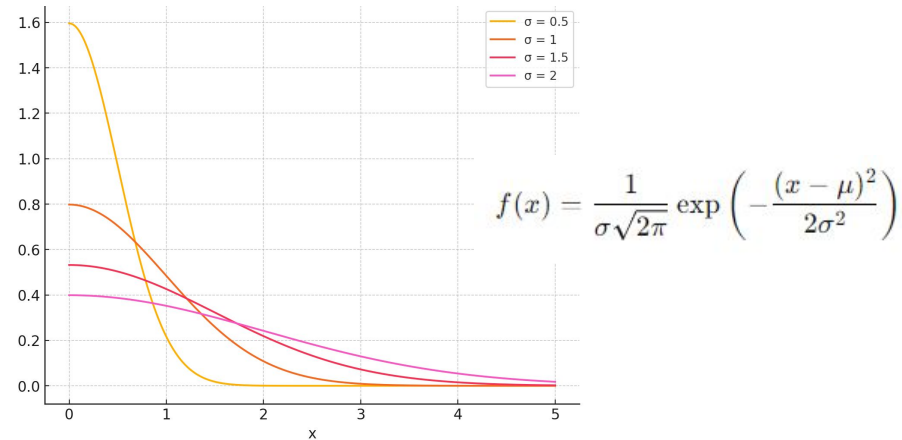
~~x3x~~ - x?



~~x2x~~ x3



Customer enrollment: What to expect?



Average day enrollments:
2000

Homebanking after cutover:
200.000

Mobile after cutover:
375.000



New Enrollment options

- App2App enrollment using Axa bank app
- ITSME
- Digipass enrollment
-



Promote Gradual Enrollment

- Accord time slots
- Spread post letters

Preparing for the Cutover



Performance testing

- Load testing
- Performance testing
- Monitoring



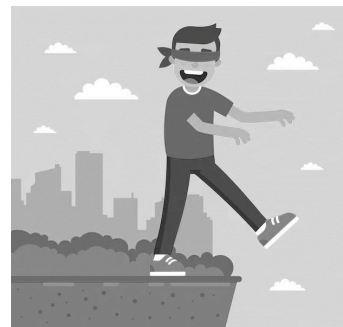
Improve software

- Connection pooling
- Rewriting queries
- Improve caching
-



Infrastructure scaling

- Horizontal scaling (Cloud)
- Vertical scaling (Core systems)
- Adding hardware (appliances)





Throttling

The silver bullet?

**HTTP 429
TOO MANY REQUESTS**

Opgelet!

Beste klant, er is op dit moment
uitzonderlijk veel verkeer naar Crelan
Mobile.

We zijn ervan op de hoogte en doen er
alles aan om dit zo snel mogelijk op te
lossen.

Probeer het op een later moment
opnieuw.

OK

Crelan Throttling Guidelines



Only to be applied at the gate
(Login)

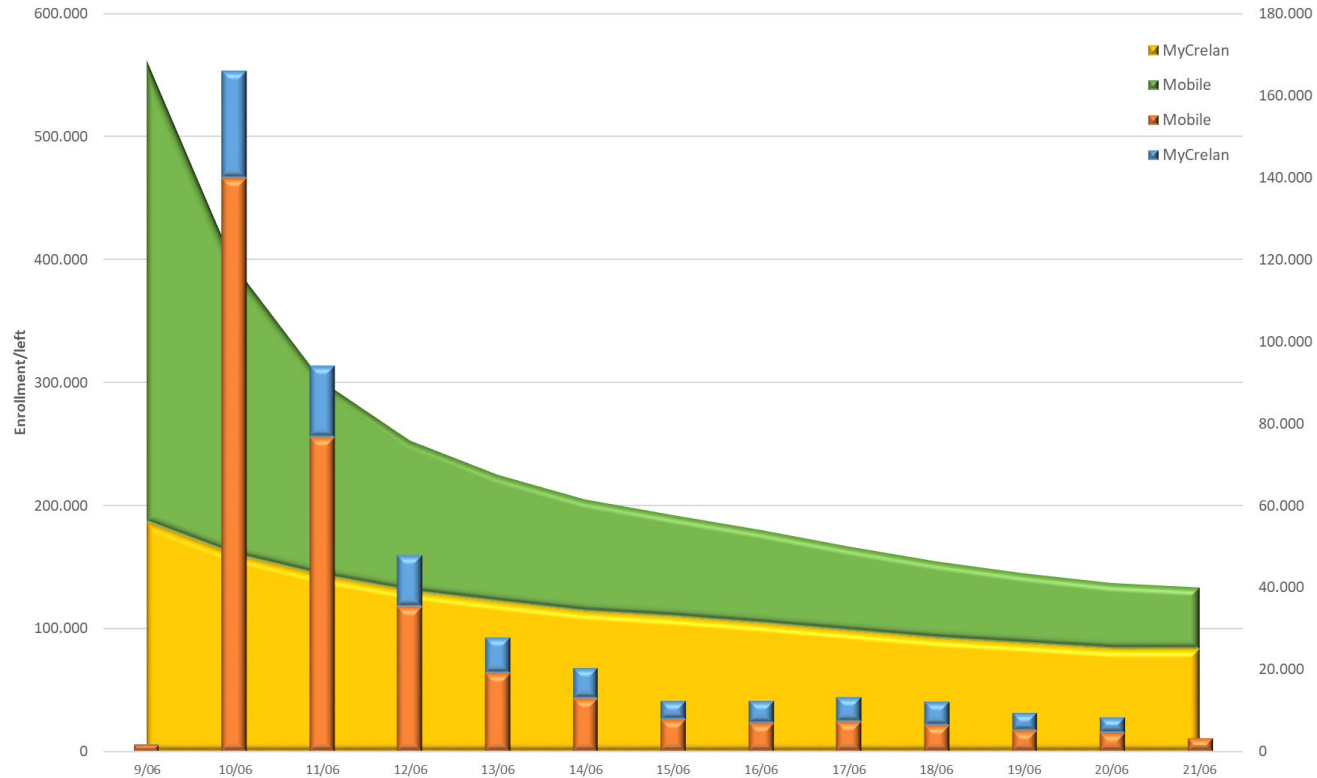


Prioritize system
integrity



Throttling = Major
Incident

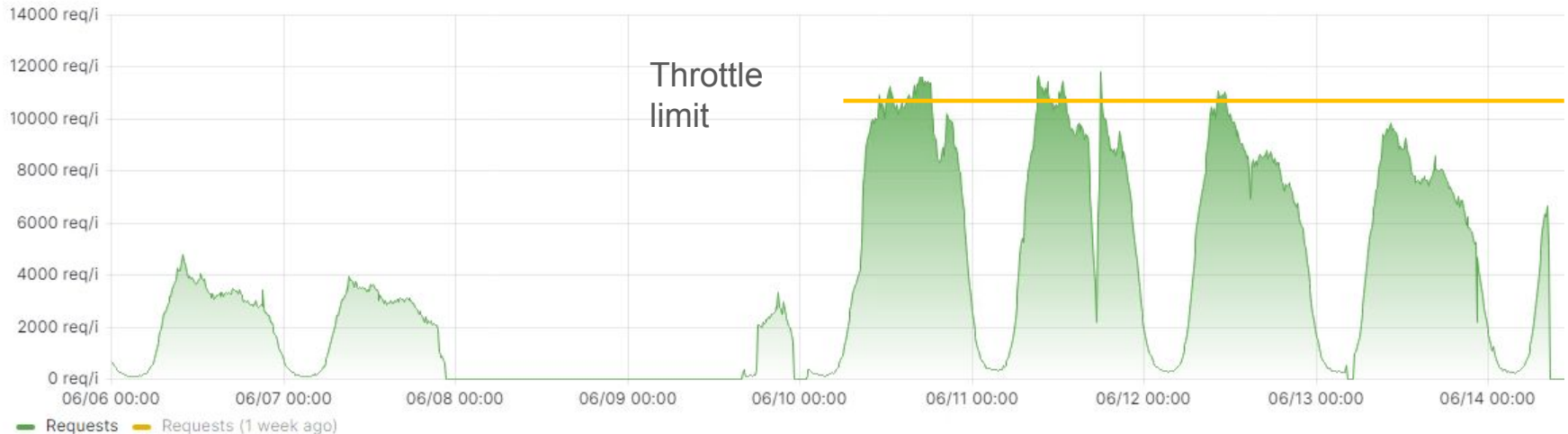
Enrollments – the result



Throttling – The effect

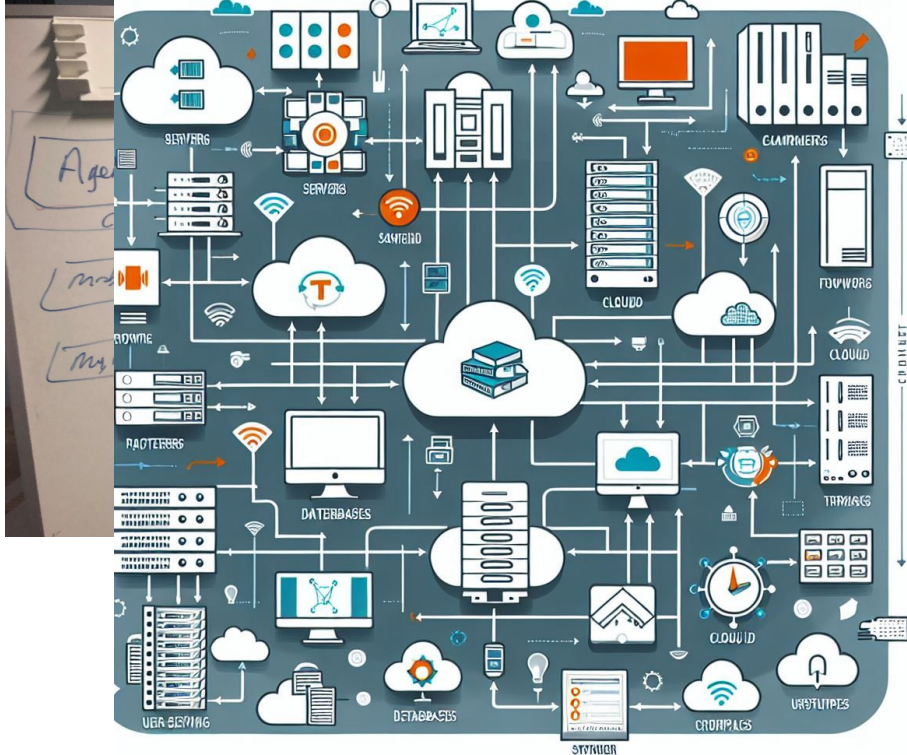
System stability maintained during cutover!

/v4/authentication/login - Register - Amount of requests over interval ⓘ ↗



Technology Selection

The approach



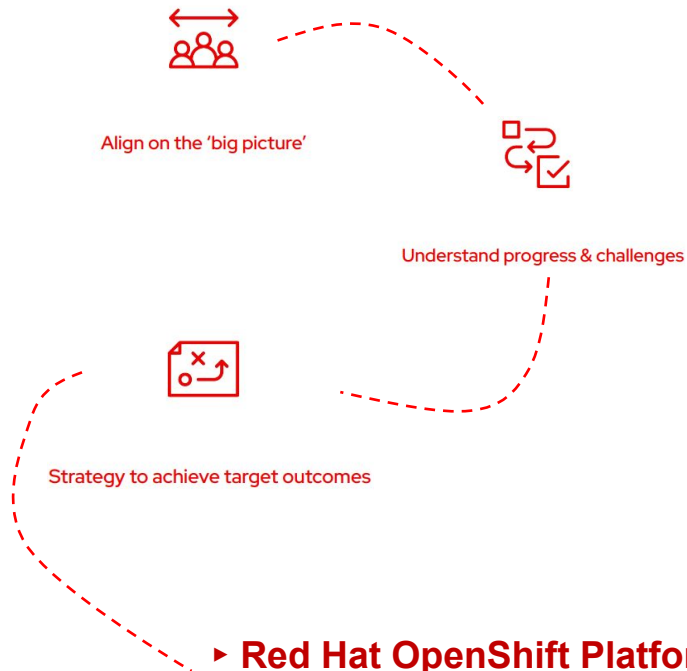
The Challenge !

- Diverse Technology stack.
- Multiple types of Integrations.
 - A service-oriented landscape in combination with legacy monolithic applications
- Visibility.
 - where is the back-end load originated?
 - What's the network traffic?
- Impact of batch processing on databases?

during our own organized DDOS attack

Technology Selection

Organizing a 'Discovery Day'



- ▶ **Red Hat OpenShift Platform Health Check** - Is the platform ready?
- ▶ **Observability** - Measuring for a Metrics-Driven strategy

The Plan



Red Hat



crelan

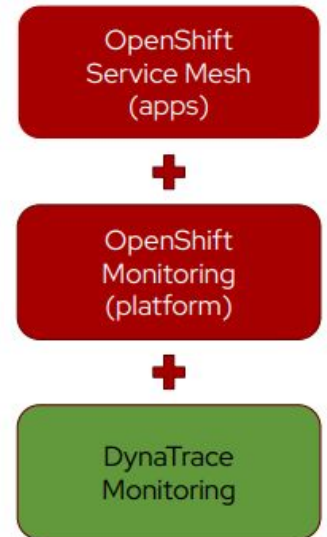
Observability

Measuring for a metrics-driven strategy

The application ecosystem involves different components deployed on OpenShift **without a clear understanding of their relationships**. This mainly **synchronous traffic** can be impacted by errors in the request chain. **Observability is key to identify the bottlenecks** and the request chain properly to identify areas of improvement or actions to mitigate issues under some circumstances.

Red Hat OpenShift Service Mesh can provide the platform for a Metrics-Driven strategy, and behavioral insight into -and control of- the networked microservices in the service mesh.

Combine it with other tools in place, such as DynaTrace, OpenShift Logging & Monitoring, to have a clear understanding of the behavior of the application ecosystem.



Technology Selection

Technologies to be considered with their own strength



API Gateway

NORTH-SOUTH

- Improved monitoring:
instead of relying on dedicated **monitoring tools for APIs**, teams can use API Gateway logs to monitor API activity, identify failure and troubleshoot issues.
- Standardized service delivery:
Centralizes the way services are delivered through APIs and microservices.
- Simplified communication:
Combines multiple API calls to request data and services, reducing requests and traffic. This simplifies API management and improves user experience.
- Flexibility:
Enables a high degree of customization, making it possible to **encapsulate the internal structure of an application** in multiple ways, invoking back-end services as needed and aggregating the results.
- Support for legacy applications:
enables interaction with legacy applications, making it possible to extend their capabilities. However, this can make migration to an API gateway more complex.

Needed **before** cut-over

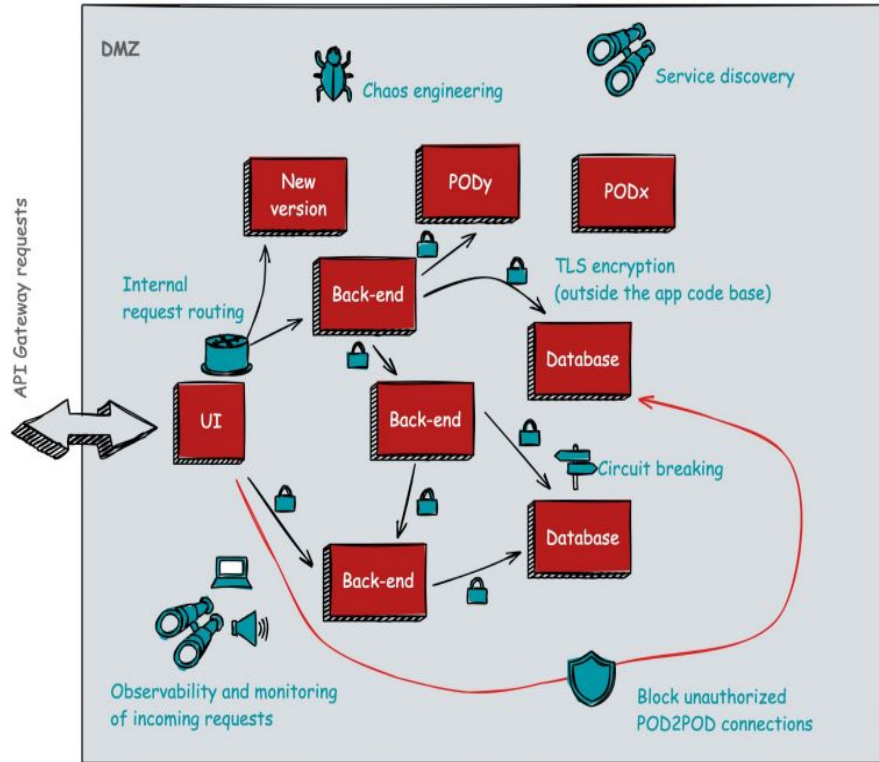
Service Mesh

EAST-WEST

- Built-in observability:
teams often have multiple tools for **tracking logging, tracing, metrics, and security controls**. A service mesh provides these capabilities out of the box.
- Improved security:
provides a certificate authority that generates service-specific certificates for transport layer security (**TLS**) **communication between services**.
- Reliability:
provides resiliency features such as service discovery, **latency-aware load balancing, circuit breakers, retries, and timeouts**.
- Traffic control:
enables fine-grained control over East-West network traffic to determine where requests are routed.
- Defect simulation:
enables developers to inject defects and delays to **simulate and debug real life problems**.
- Abstracting communication logic:
reduces the amount of code in a microservice, by taking care of concerns like networking, service retries, and timeouts, etc.



Technology Selection



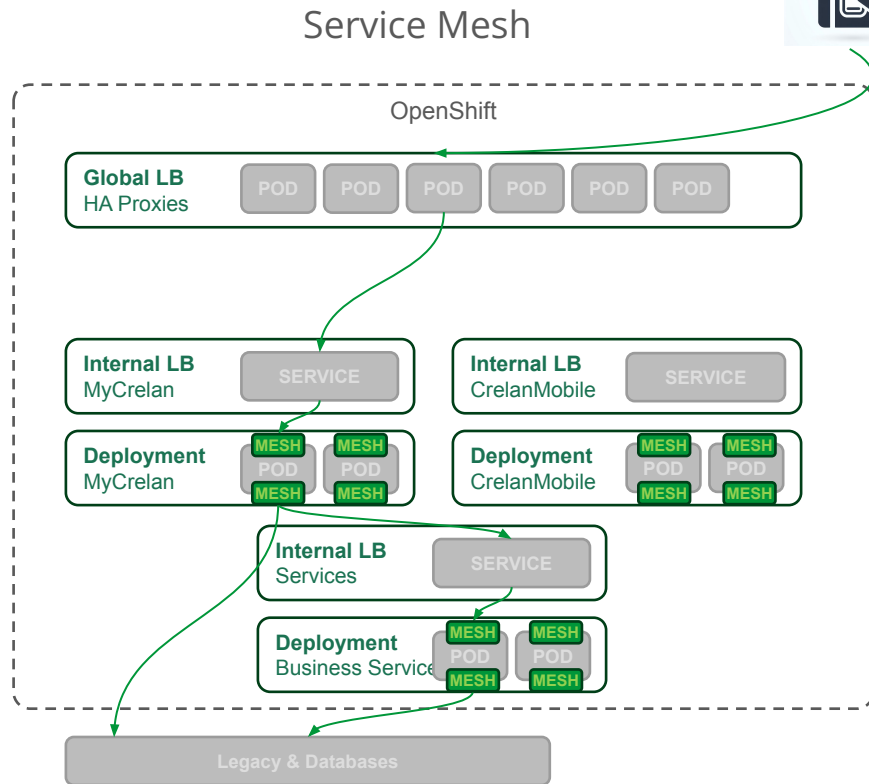
Architecture

Deployment view



Mesh deployed as a sidecar.. Deployed transparently!

By default, no rules active!
In this setup you always get the insights



First identify your real problem,
then apply the right technology.

