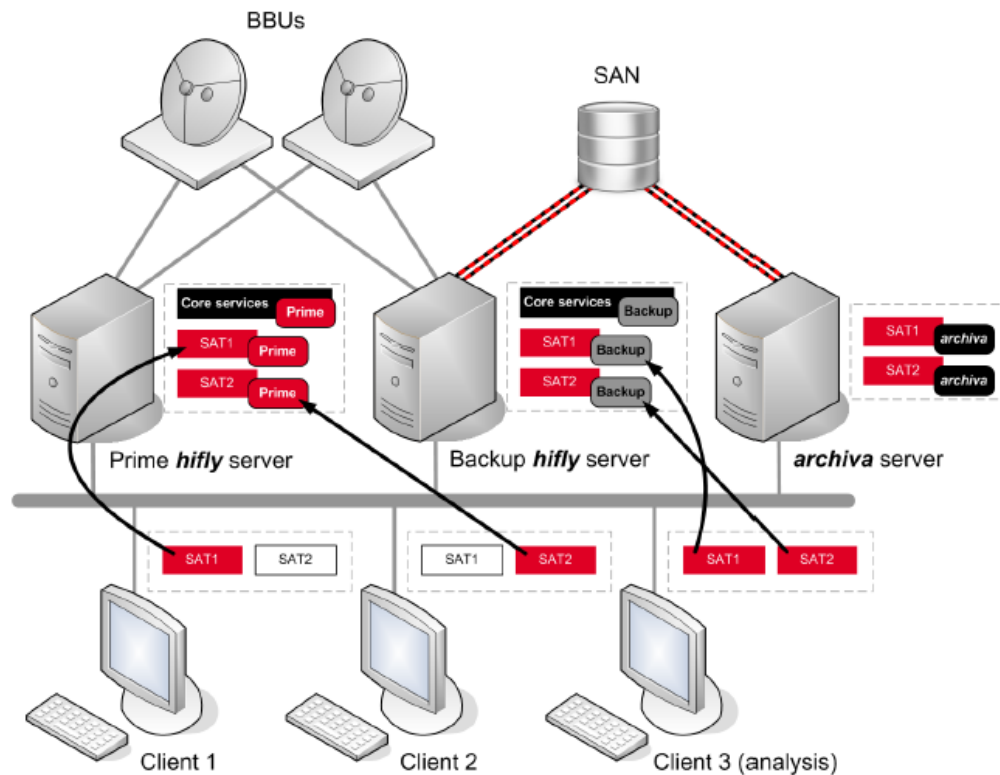


# Microservices architecture for the ground segment

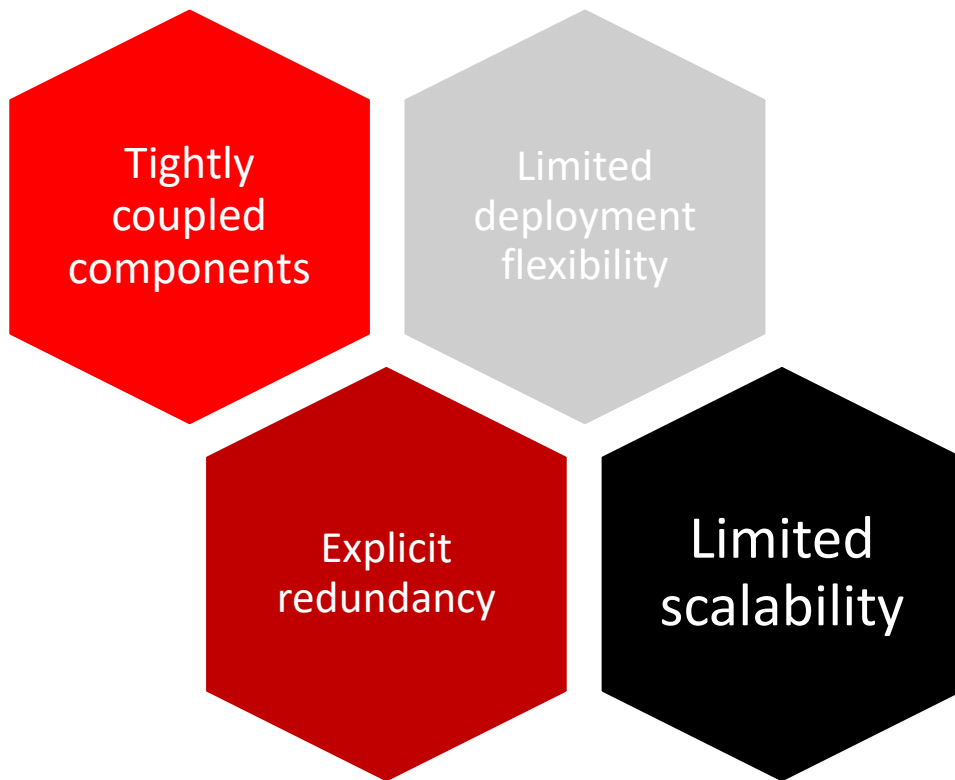
**Resilient**  
**Scalable**  
**Zero-downtime**



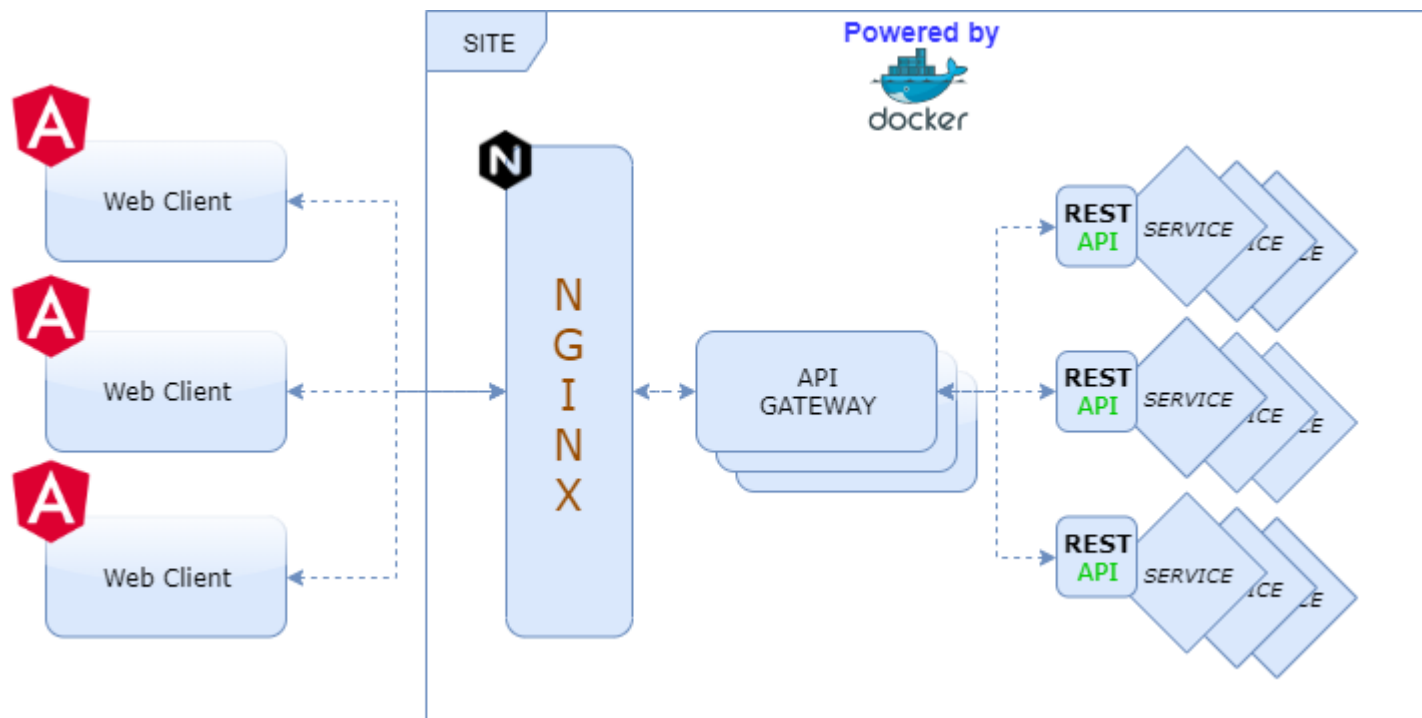
# Traditional deployment



# What we don't like



# Web UI + Microservices



# Inspiration

## Scaling out



C++ monolith > Pearl/C++ monolith > Java/Scala microservices



Pearl monolith > C++ monolith > Java microservices



Rails monolith > JS/Rails/Scala microservices



Java Monolith > Java / Scala microservices

# Why?

## Even if we are not Netflix

- 1 Enlarged portfolio of services:**
  - Remote access to end clients
  - Support for highly reconfigurable satellites
  - Constellations

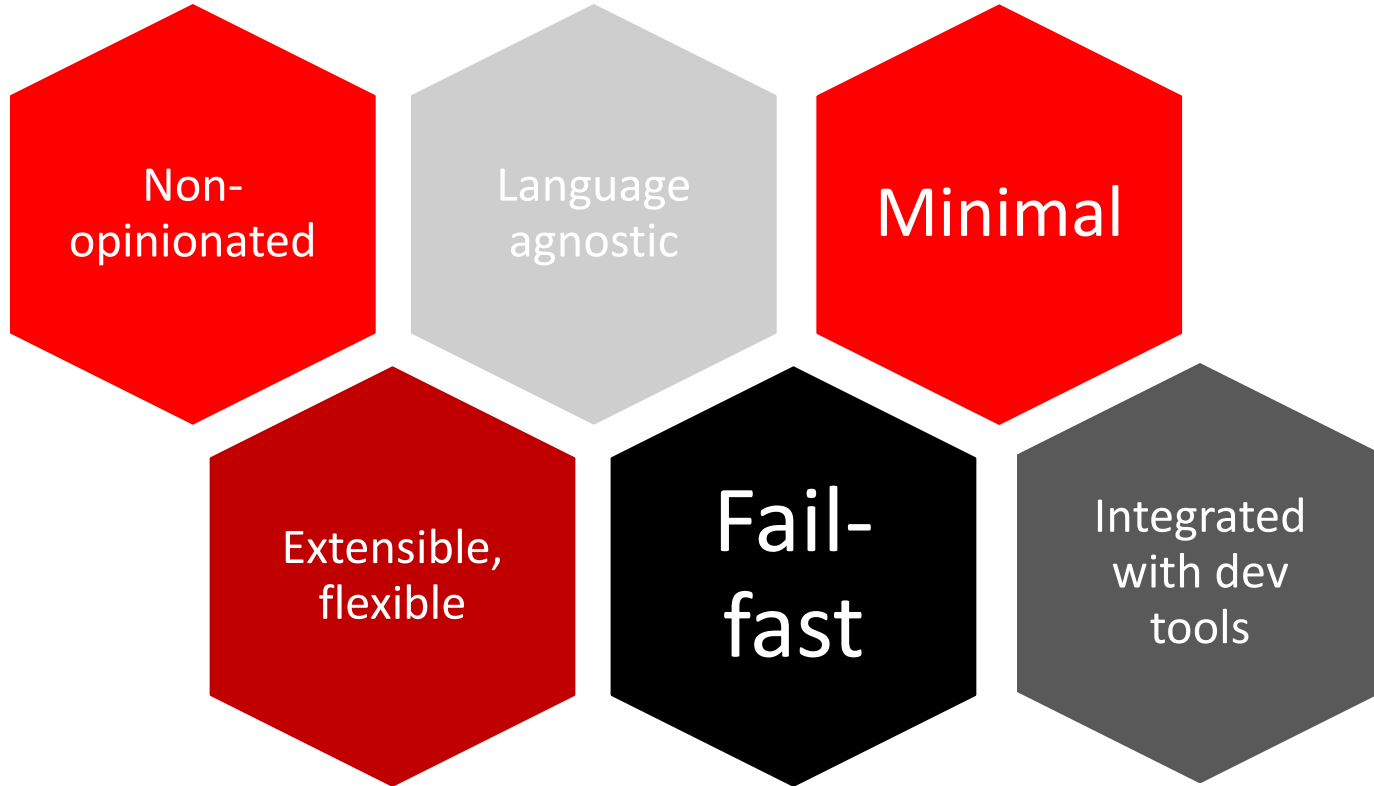
- 2 Resiliency:**
  - Multiple redundancy
  - Stateless services
  - Chaos testing

- 3 Scalability:**
  - Horizontal scalability
  - Cloud-ready
  - Fleet support
  - Cost-effectiveness

- 4 Dev-friendly:**
  - Modern technologies
  - Web UI
  - Integrated devops

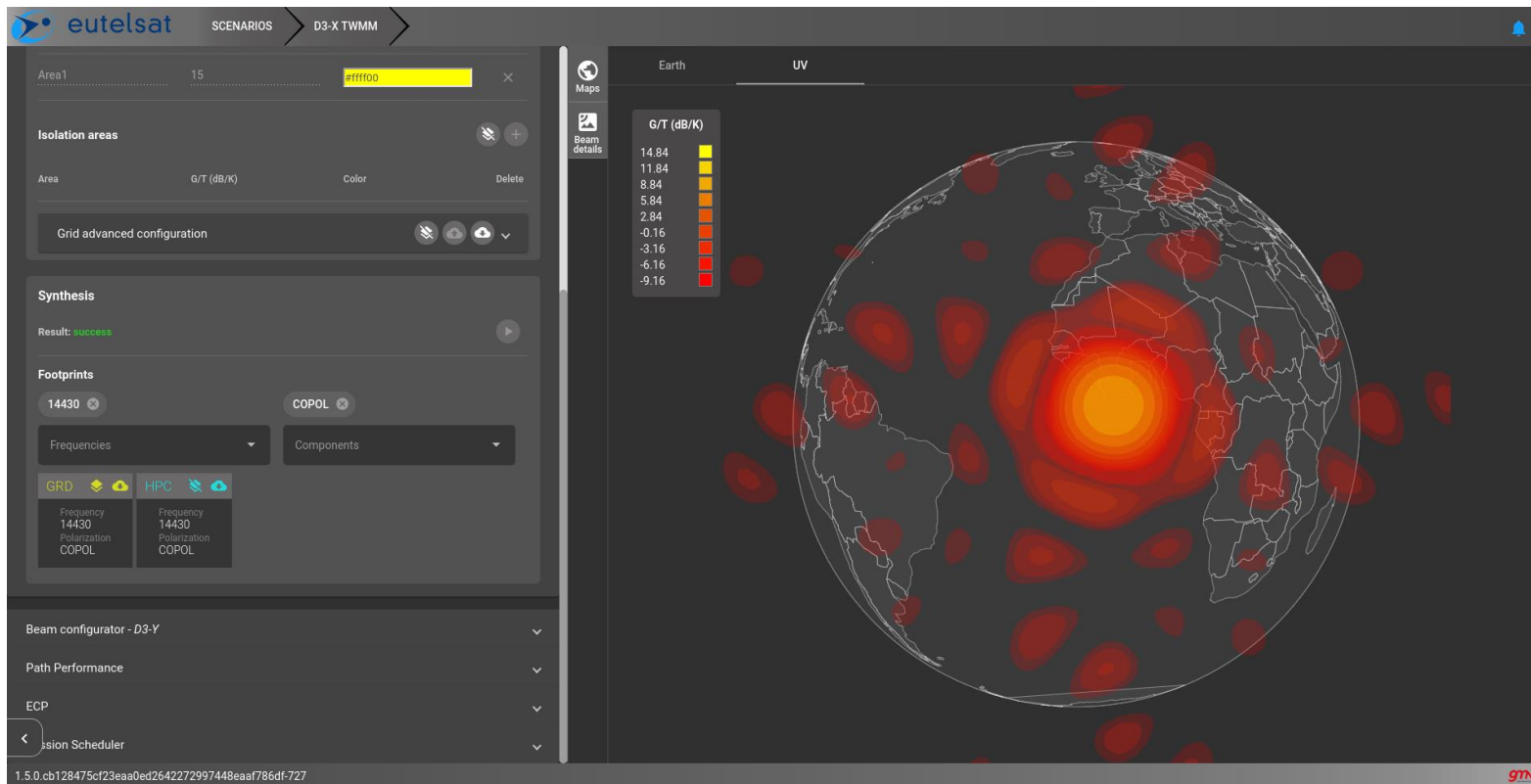
# GMV's approach

## Hydra microservices



# GMV's approach

## CMRS – payload control suite





# GMV's approach

## smart rings – payload control suite

**smart rings**

SCENARIOS
DEMO-TEST

DEMO

admin

General information
Frequency plan
Path

**Stages**

Stage	Status	Solver status	Selected solution
Overall			
FWD-DNC-Ring			
FWD-GW-Switches			
FWD-LCTWTA-Ring			
FWD-LNA-Ring			
RTN-DNC-Ring			
RTN-GW-Switches			
RTN-LCTWTA-Ring			
RTN-LNA-Ring			Solution 1

**TM and Reference data**

**Mission reconfiguration**

Overall
RTN-LNA-Ring

**Configurations [1]**

Configuration	Rotated switches	Switch rotations	Disturbed signals	Disturbed channels
Reference				
Solution 1	2	2	0	

**Solve**
Auto mode

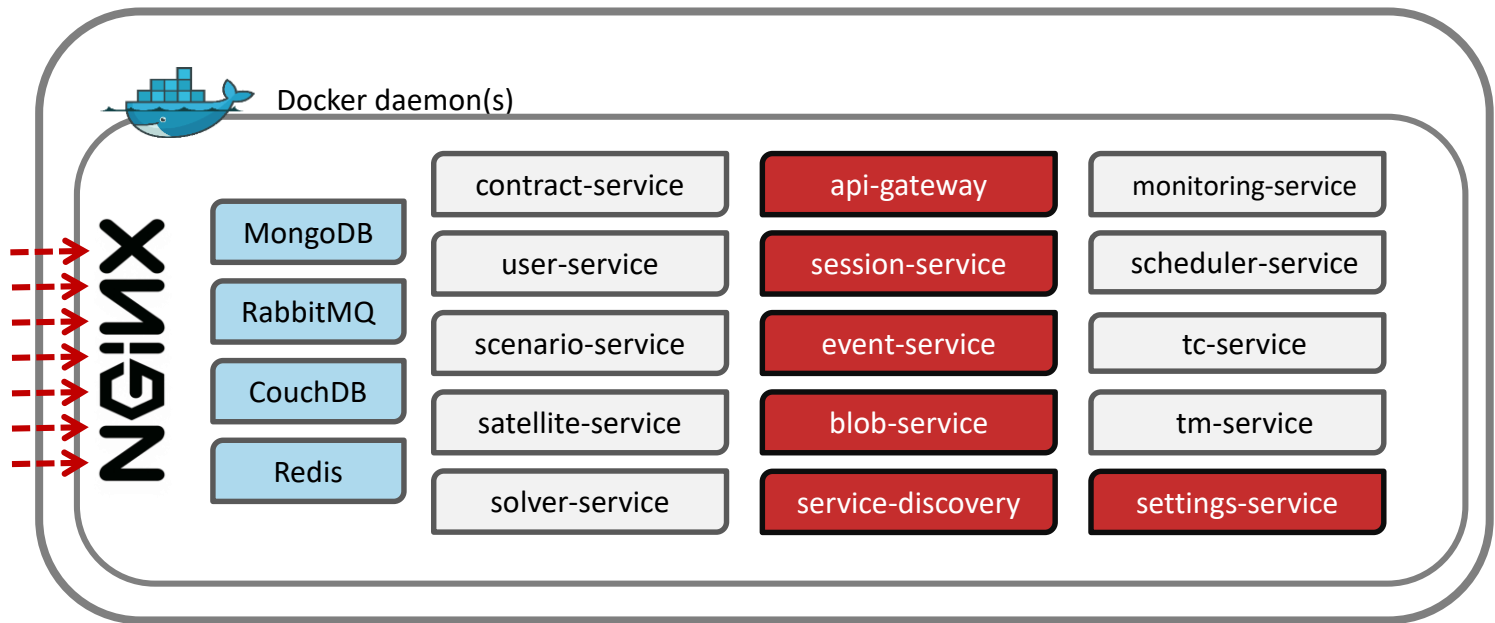
**Channels**

Channel	Chk.
R01	✓
R02	✓
R03	✓
R04	✓

4.0.0

# GMV's approach

## smart rings – payload control suite



# GMV's approach

## Success and failure

### The good

From local to  
cluster in seconds

Quick adoption by  
new projects

Painless  
integration of  
legacy  
components

### The bad

Error traceability

Circuit breakers

Too much direct  
communication

gmv.com

# Thanks

