

Red Hat
Summit

Connect

Industrializing Next-Generation
Digital Platforms
with Platform Engineering:

The **Eurocontrol** Case Study

Meet the Speakers



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Technical Product Manager



Eurocontrol

A digital transformation
journey for the European
aviation network



EUROCONTROL

41 Member States + 2 Comprehensive Agreement States

EUROCONTROL OFFICE LOCATIONS



BELGIUM

Brussels (HQ, Network Manager & CRCO)



NETHERLANDS

Maastricht (Maastricht UAC)



FRANCE

Brétigny-sur-Orge (Innovation Hub)



LUXEMBOURG

Luxembourg (ECTL Aviation Learning Centre)

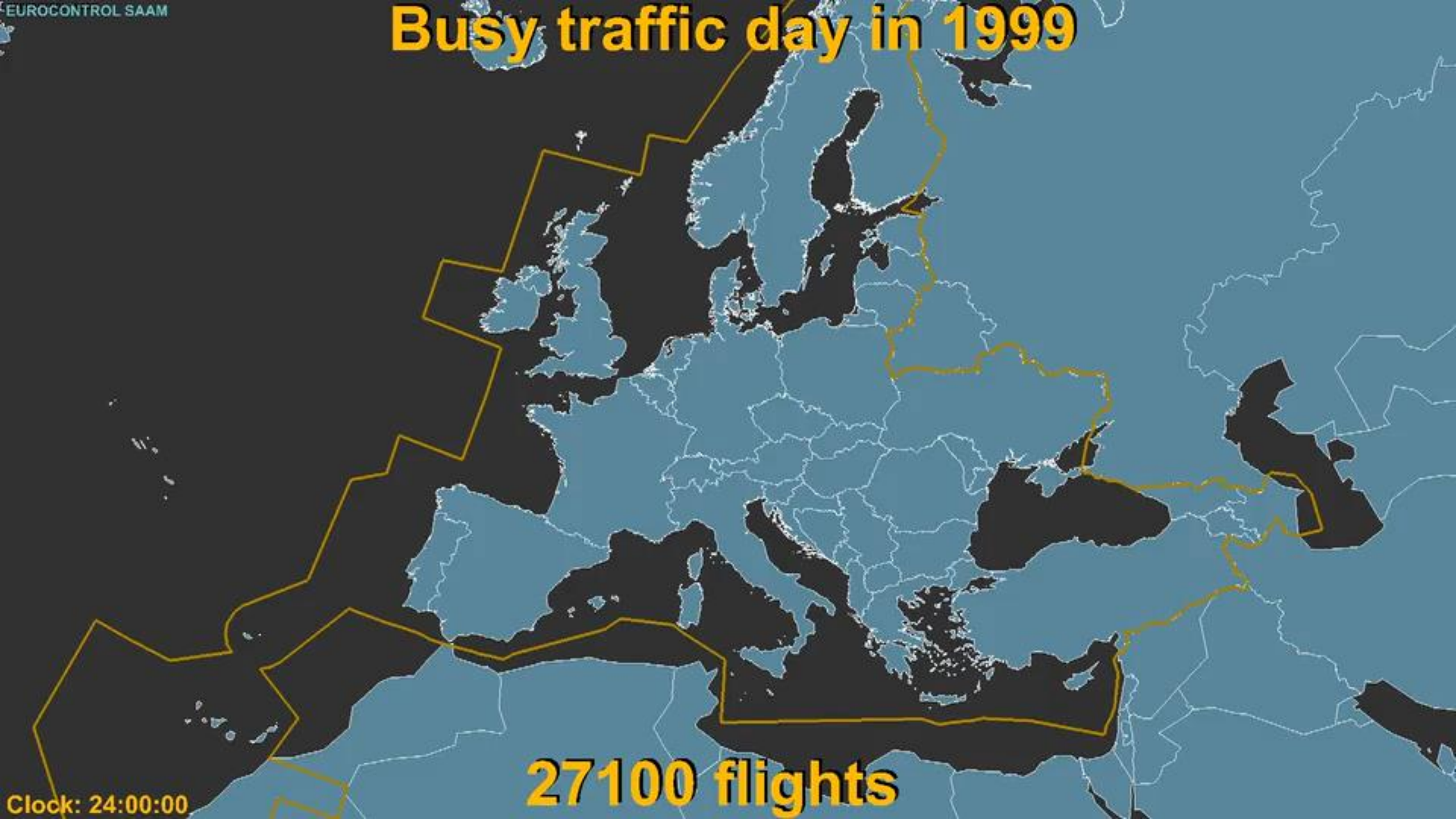


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Busy traffic day in 1999

Clock: 24:00:00

27100 flights



THE BUSIEST DAY IN THE EUROCONTROL NETWORK

37,228 flights

Friday 28 June 2019



Clock: 00:00:00

1386 flights in NM area

Busy traffic day in 2030



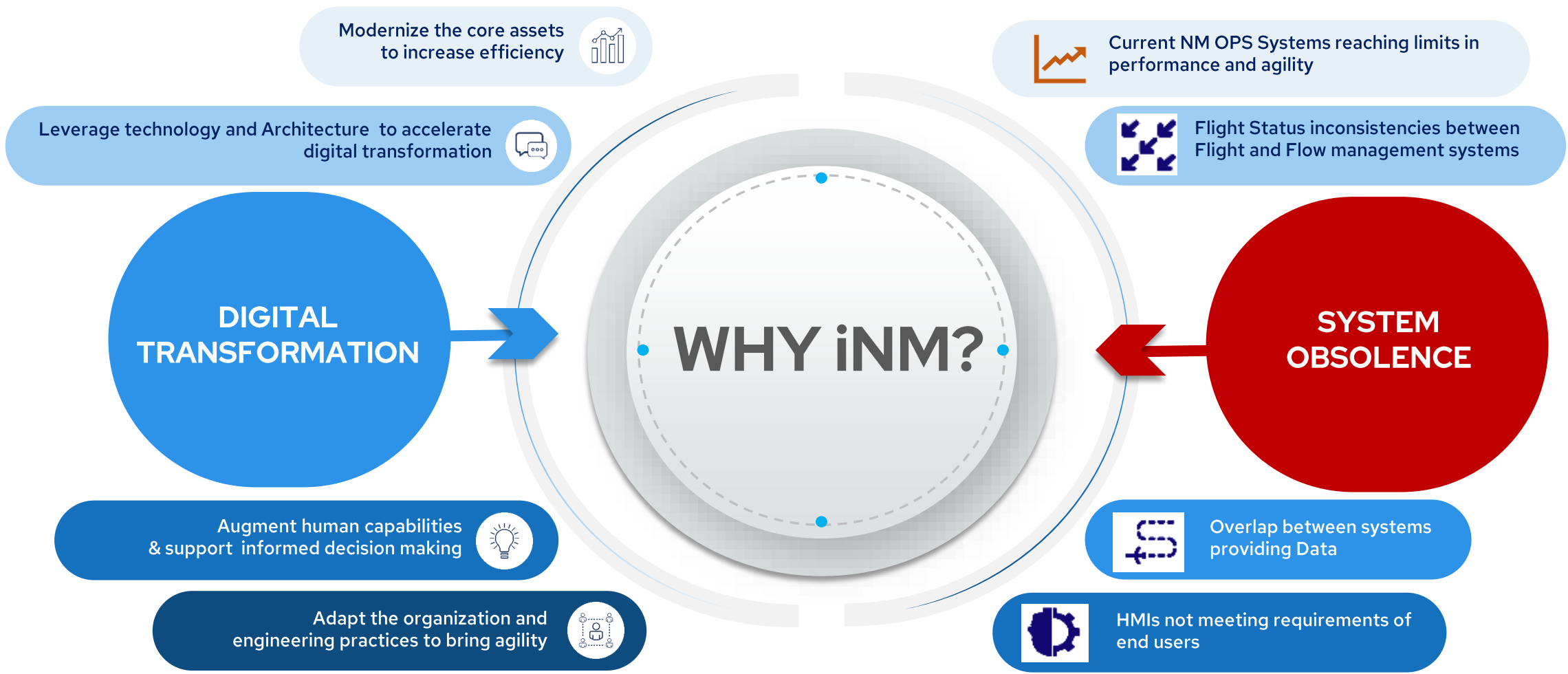
58000 flights

Clock: 00:00:00



Will aviation cope in 2030 with 50000+ flights/day?

- **Safety?**
- **Security?**
- **System Capacity?**
- **Environment?**



iNM – Supporting European Aviation



The iNM programme enables us to manage 13.8 Million flights by 2030...



370 Mio euros

...and ensures that NM can deliver its efficiency targets keeping flight delays and environmental impact to a minimum whilst supporting aviation growth

User Experience



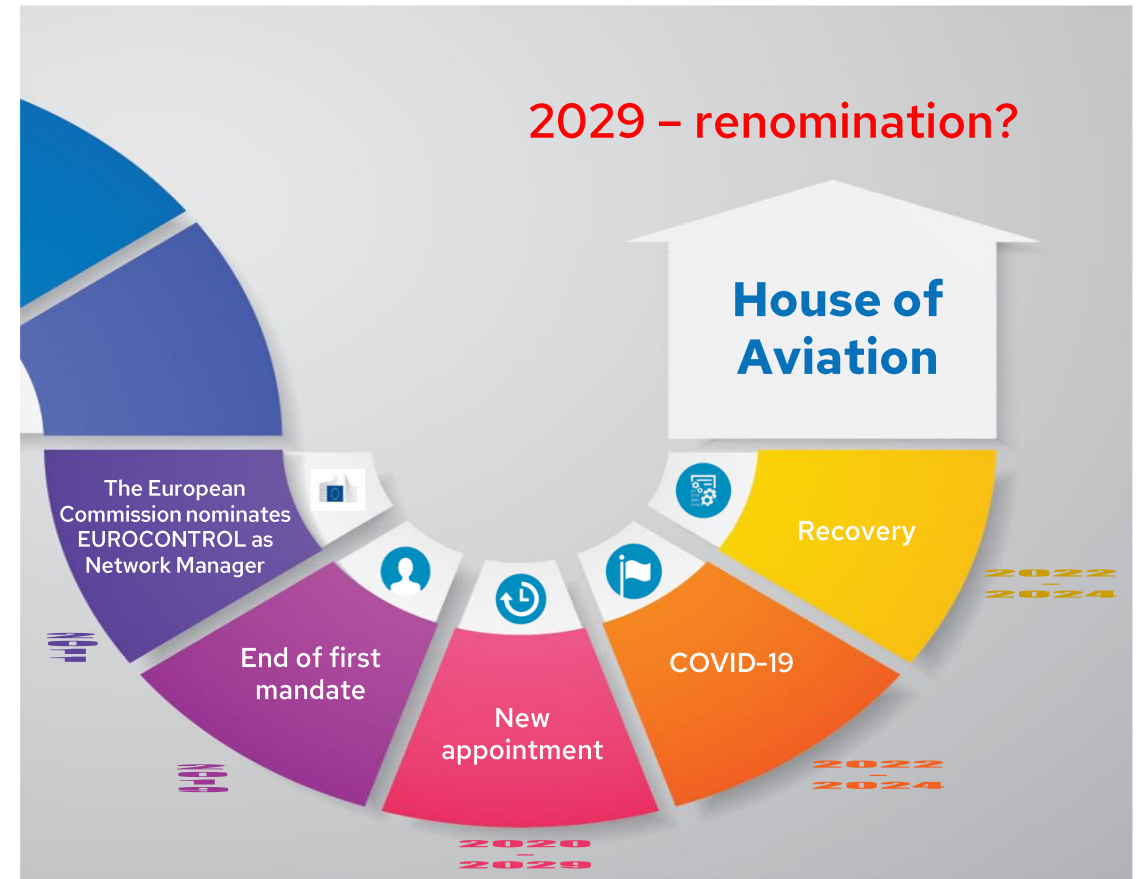
Process Automation



Performance



iNM for EUROCONTROL



Success of the iNM programme will require outstanding performance and commitment, supported by strong collaboration within the ecosystem.

//

We may have all come on different ships, but we're in the same boat now.

Martin Luther King, Jr.





Modernizing
digital products
for the Air Traffic Sector

The Modernization Challenge:

Presentation of the specific challenges in the air traffic sector.
The complexity of modernizing mission-critical applications with a strong legacy.

The Dilemma of Deadlines:

How certification timelines in the sector can surpass the support cycles of products like Red Hat OpenShift.
The need to find a balance between innovation and stability.

Indra in Air Traffic

Global player

Guaranteeing safe, efficient and profitable flights, in a difficult context with constantly increasing air traffic

Innovative solutions

Our innovations improve the service resilience of our partners

Environmental benefit

Enabling CO2 and noise reduction of flights, whilst improving capacity



+5,700

Implementations in over 180 countries

+100

Years of experience in ATM solutions

+85%

Passengers worldwide travel making use of Indra ATM technology at some point during the flight

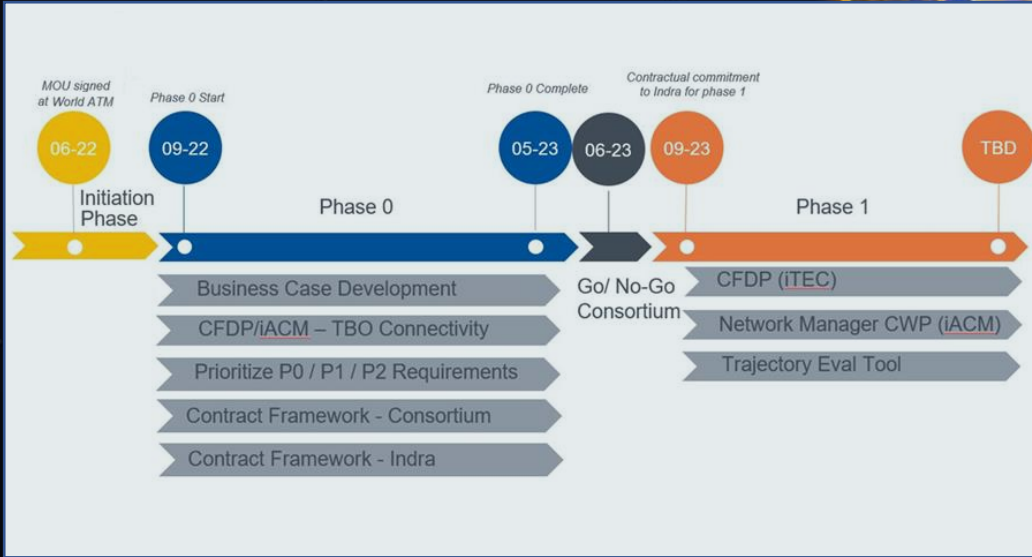
iTEC SkyNex

The largest network of Control Centers, managing +60% of European air traffic on the same technology and more than 7 Million flights.



evaluation period

Jun, 2022



NAV CANADA evaluation platform

Exploring Interoperability Through European-Canadian Collaboration



ENAI RE NATS



LVNL



AVINOR



ON



PANSO



NAV CANADA



indra

2022

2022

2022

2022

2022

JUNE

JUNE

JUNE

JUNE

JUNE

JUNE

JUNE

JUNE

Transforming EUROCONTROL Network Manager Digital iNM

10 Years

Framework Contract

7 Running Projects

Indra has been awarded iNM, a programme that will digitalise the whole Network Manager System

+3.5M

legacy systems
SLOCs

35

Digital Products
in scope

14 teams

9 subcontractors, and
5 Indra units working
together and adding
capabilities in an
integrated team

+40000

Flights per day
managed by NM
systems (2019),
expected 20%
increase

Keystones

Balancing **ambition and evolution** ensuring a smooth transition of the mission critical systems

Combination of **portfolio** of ATM products and **digital capabilities**

Strategic partner of EUROCONTROL, and vision of **the ATM future**, cooperating in an **ecosystem** with other key European players

Scope: Roadmap Management, Architecture, development and delivery of digital products

Programme Phases

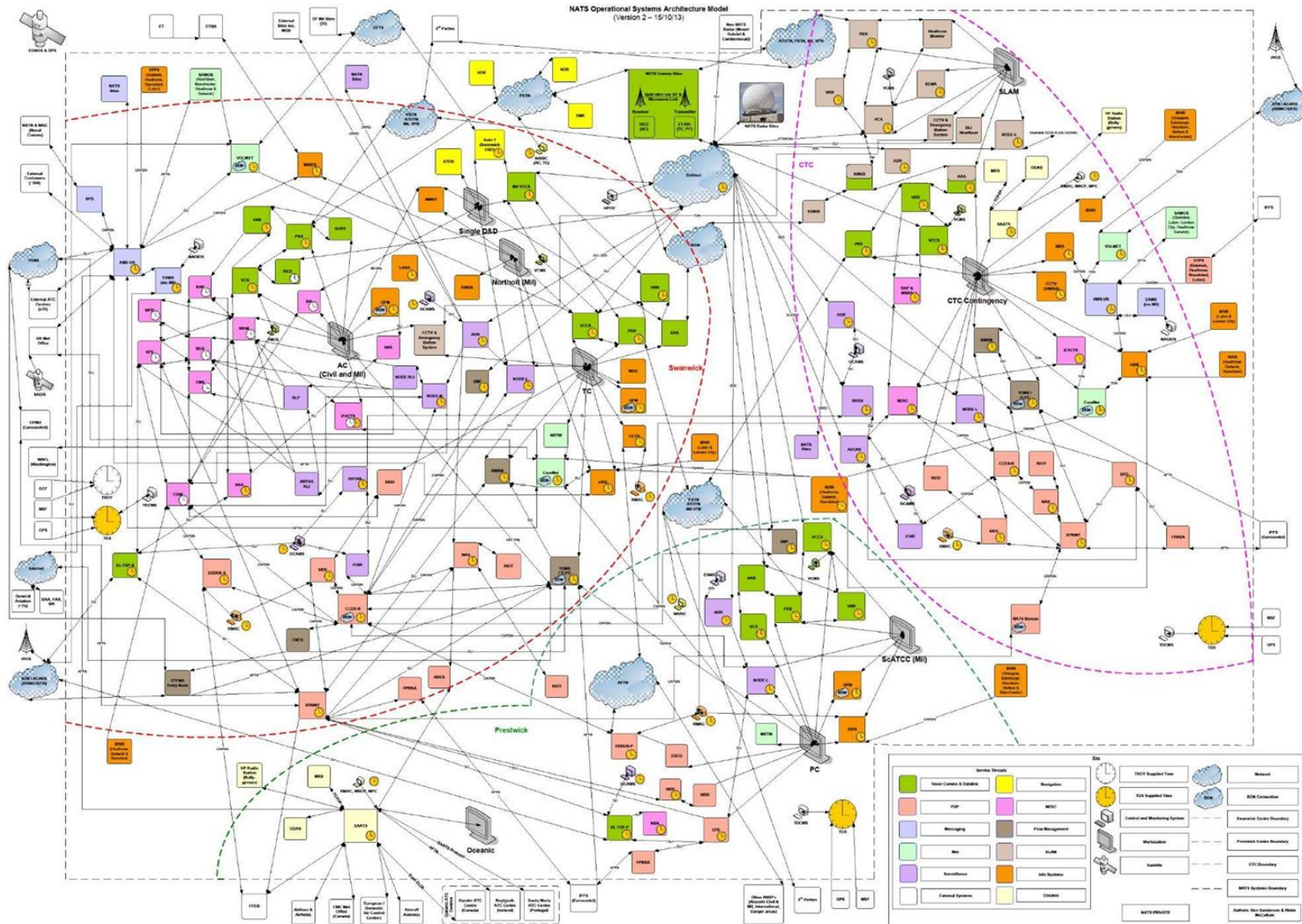
Phase 0, delivery of initial version of the trajectory calculation (by iTEC), aeronautical information system and data platform

Phase 1 replacing the core of legacy systems and commencement of advanced solutions. First version of DPLT

Phase 2 (25-27) transition to digital iNM completed, first advanced solutions based on AI/ML available

Phase 3 (27+), Industrialization of advanced solutions

An example of a real ATM architecture



A black and white photograph showing two men in a workshop or factory setting. The man on the left is wearing a dark suit and a hat, looking towards the man on the right. The man on the right is wearing overalls and is leaning over a large, complex mechanical device with many gears. The background is filled with various gears and mechanical parts. The overall scene suggests a historical or industrial context.

**But... what
century does this
guy come from?**

The enemies against which we need to fight this battle

1

Existing **monolithic applications** that must be maintained and evolved.
Some of them with Middle Age programming languages

2

Strong **non functional requirements** (reliability and performance), under **strict safety / sw assurance regulations**

3

Lack of a standard solution, which can be maintained in 24x7 operation for over 10 years

A huge opportunity

- iNM DPLT Project can be the de facto standard for the European ATM
- Our customers in iTEC are looking at us for solutions for their platform projects
- We simply cannot sustain the current way of working, leading to large programmes that take years to go live
- Combination of technology and business capabilities, and we know much more about technology than our customers
- Let's hear a bit more about how is this built!





Paradigma

Platform engineering:
Building Golden paths

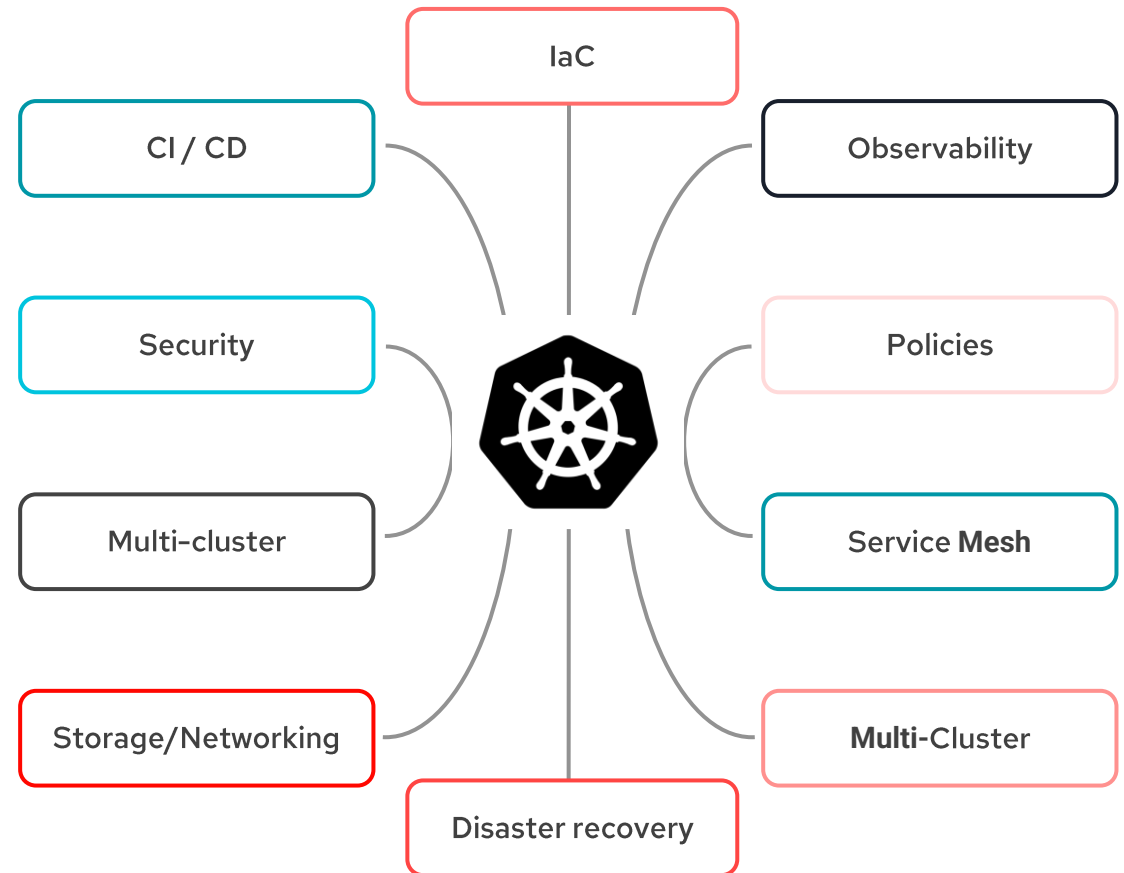


Eurocontrol: a Kubernetes-based platform

The foundation of **EuroControl's** modernization journey is built on a robust **Kubernetes** platform.

Paradigma, as the platform team, plays a pivotal role in ensuring the success of the initiative.

We follow and champion the principles of **platform engineering**, ensuring that the platform meets technical requirements and also aligns with best practices and industry standards.



Platform Alignment with the Industry: CNCF's Leadership



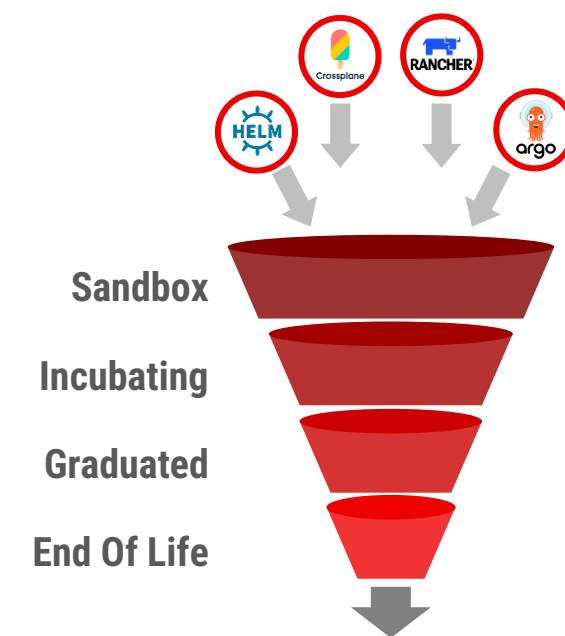
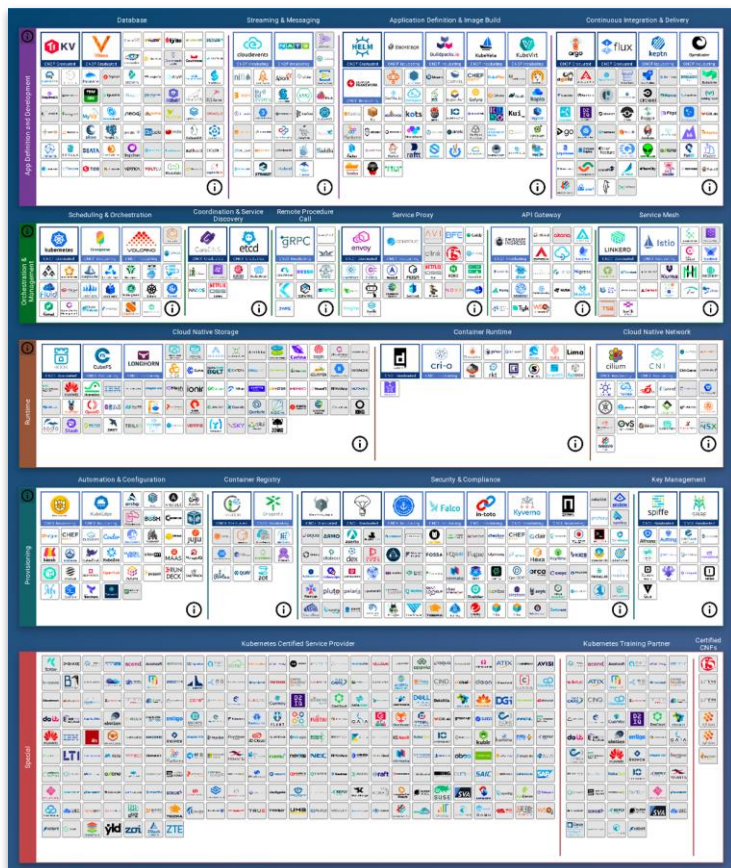
The CNCF propels the Kubernetes ecosystem forward

INDUSTRY ADOPTION

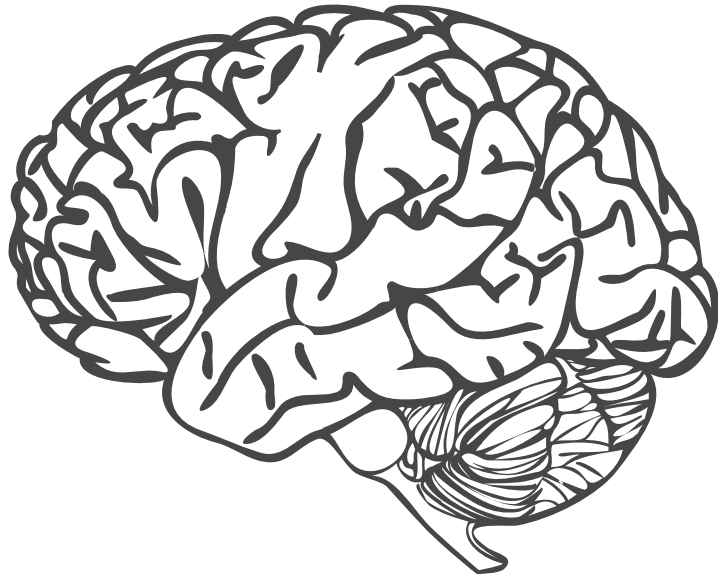
Various maturity levels ensure that the ecosystem is in sync with industry needs and also offers guidance for technology selection

INNOVATION

Through the embrace of emerging technologies, the CNCF guarantees that the ecosystem stays relevant.



Cognitive Load: A threat to both platform and development teams



Despite CNCF's guidance, navigating a constantly evolving and intricate technical ecosystem remains a formidable challenge.

The **cognitive load** is a shared burden, affecting both developer and platform teams alike.



The cognitive load involved in a task is the cognitive effort (or amount of information processing) required by a person to perform this task.

(REIF, 2010)

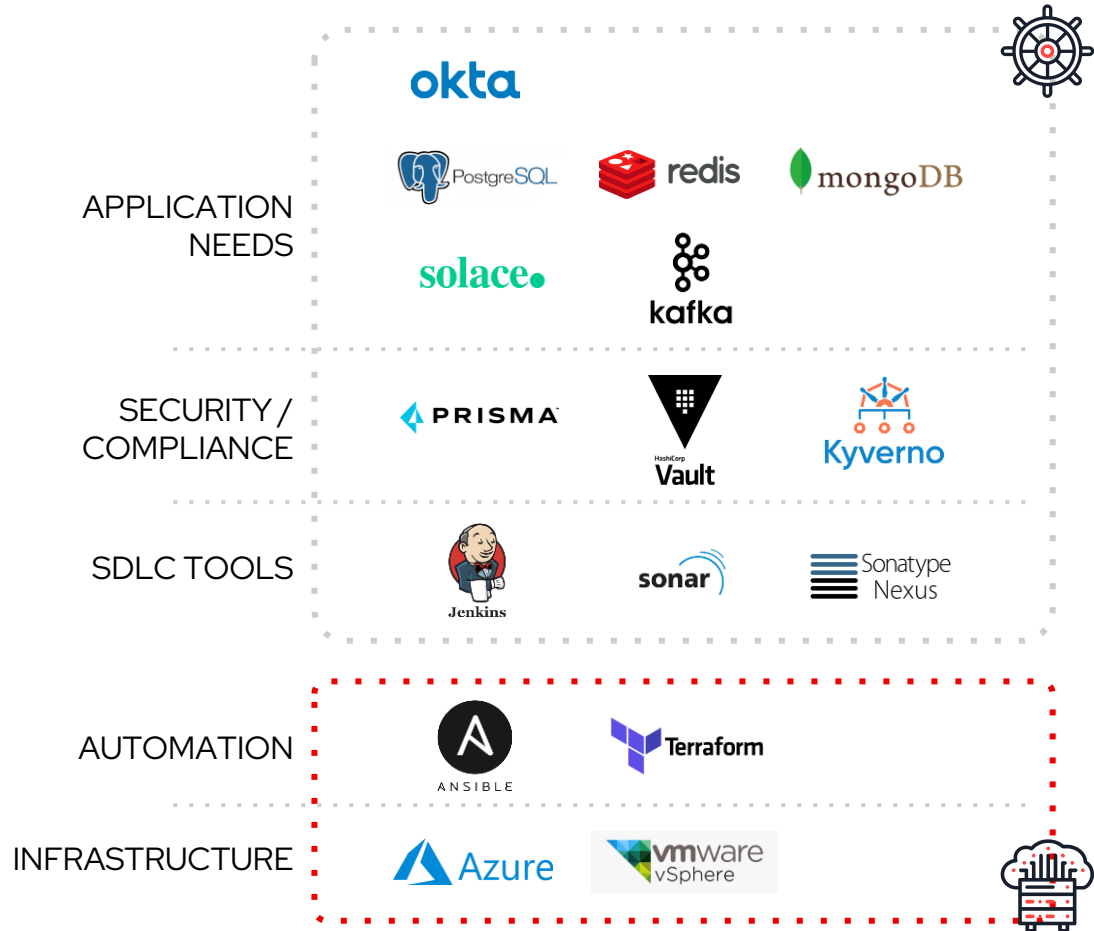
Red Hat to the Rescue!

Red Hat OpenShift significantly reduces the cognitive load, offering a streamlined cloud-native experience.

Seamlessly integrates and selects key CNCF technologies, without the hassle of manual integration, reducing the challenges and complexities developers and platform teams face.



Remaining Challenges: Beyond the OpenShift Baseline



But **significant challenges persist...**

In addition to all services on top of Kubernetes, the platform team also needs to manage infrastructure through automation

This goes beyond mere feature addition.

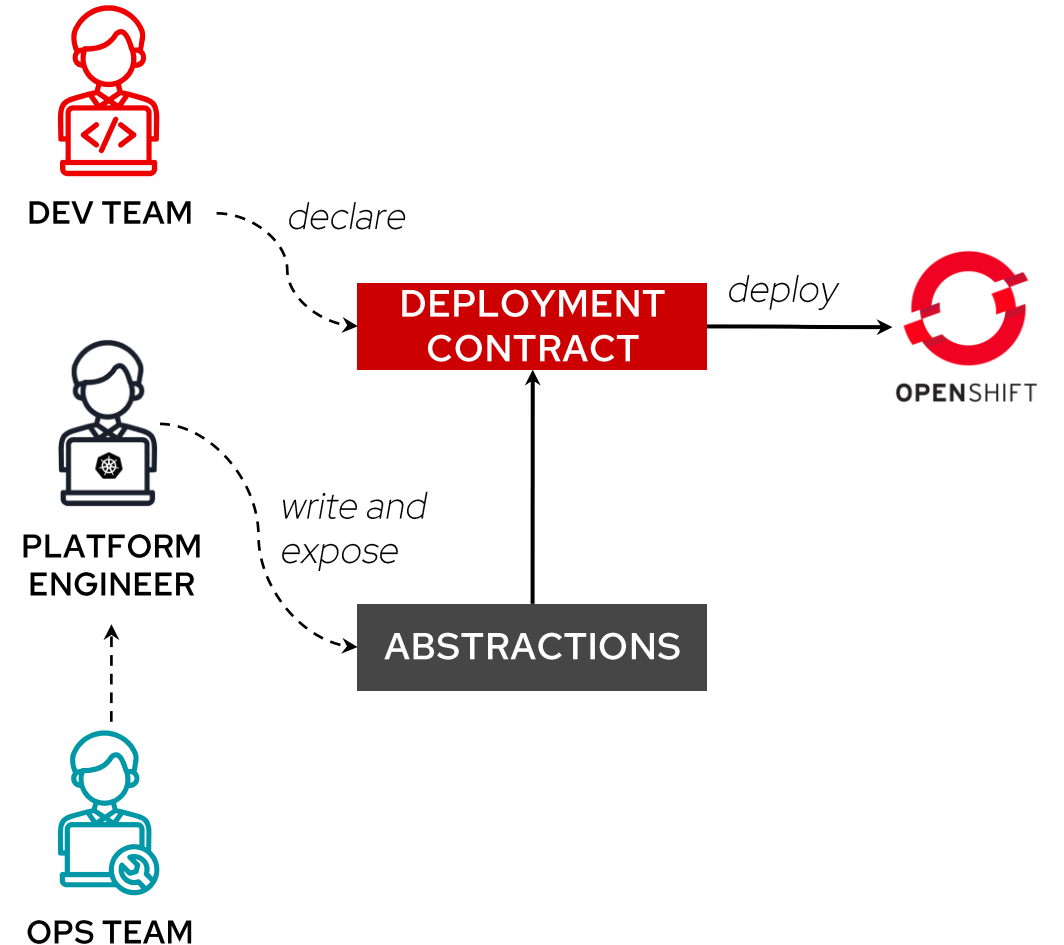
It's about crafting a platform tailored to meet the diverse application requirements and operational needs defined by EuroControl.

Building golden paths for development teams: abstractions

Direct exposure of all services to dev teams can lead to increased cognitive load and inconsistent deployments.

EuroControl advocates for **abstractions** as '**Golden Paths**' to reduce this cognitive load and ensure operational requirements are always met.

These abstractions built by the platform team offer developers a **simplified deployment contract**, streamlining the development process.



Paving the modernization journey



By improving the **developer experience** we transform complexities into streamlined workflows.

Abstractions not only reduce the cognitive load but also ensure that as we modernize, consistency, quality and compliance are preserved.

These principles pave a clear and efficient path for modernization, ensuring future readiness and adaptability.

Visita nuestro stand y asiste a nuestras demos.

Demo 1 - 14.30:

Platform engineering: Instrucciones de uso

Demo 2 - 15.00:

Platform engineering: Golden Paths para entornos de desarrollo

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