



La force de notre réseau : une dynamique solidaire



Le Contrôle de Trafic Aérien en Europe

Philippe Merlo

Directeur ATM

Gerald Amar

Expert confirmé



La force de notre réseau : une dynamique solidaire

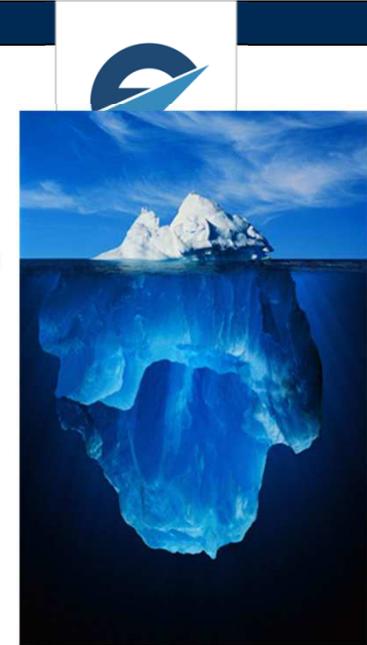


Le Contrôle de Trafic Aérien en Europe

Présentation Générale

Philippe Merlo
Directeur ATM

Visible Part of the Big Picture



Visible, and commercial part



Ticketing:

- commercial activity, public services not involved
- standardised, global distribution systems (e.g. Amadeus)
- safety (8.3 billion Euros in 2012) and security paid by passenger



Information:

- beneficiary is passenger, joint interest of airport and airlines in info provision, powerful catalyst of public opinion
- local system operated by airport, updated in real time by airlines

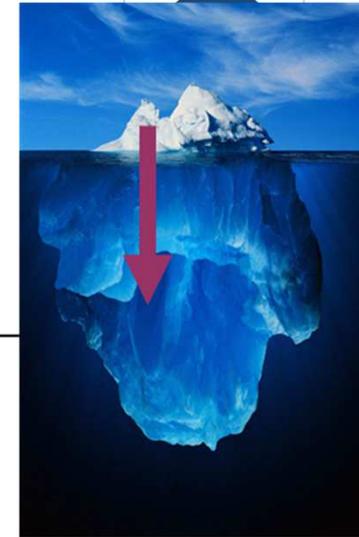


Shopping:

- source of revenue for airports, creates airport image
- airlines and public services not involved

Still visible but with links to the hidden part now...

Visible Part of the Big Picture



Still visible but with links to the hidden part



Airline staff:

- cabin crew → onboard safety, security and passenger comfort



- cockpit crew → flight safety → license + permanent link with Air Traffic Control system



Airports:

- private entities, fierce competition, bottleneck for air traffic
→ Air Traffic Management (ATM) organisations involved ('Gate-to-gate' concept)



Aircraft:

- owned by an airline or a leasing company, operated by an airline
- safety → certified + standardised equipment → regulatory bodies involved

Hidden Part of the Big Picture

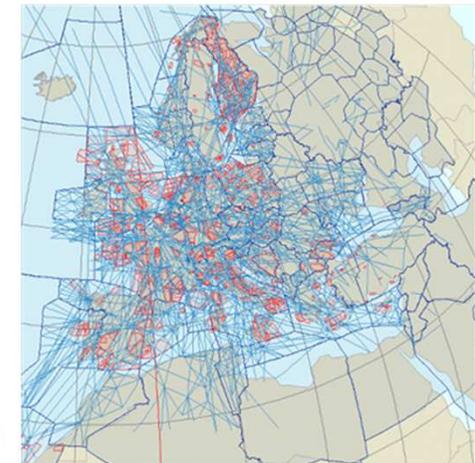


Flight story (and involved organisations)

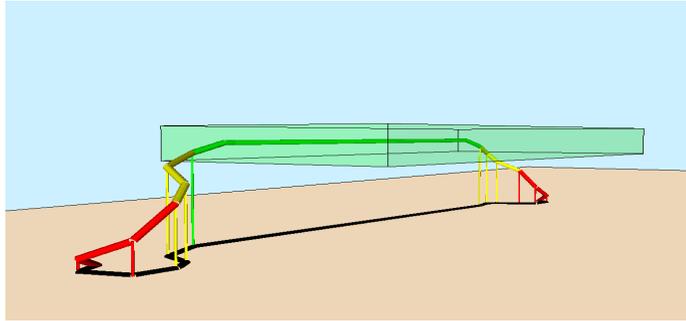
- ❑ **Before departure** (*civil/military flight operator, EUROCONTROL*)
 - **flight plan data**
 - **strategic planning** (months in advance) to assess demand and implement measures
 - **tactical planning** (hours in advance) to avoid overload of ATC system (NM role)

- ❑ **When airborne** (*flight operator/pilot, Air Navigation Service Providers*)
 - **pilots** : to aviate, navigate and communicate
 - **air navigation services**: ensure flight safety (collision avoidance, information)

- ❑ **After arrival** (*EUROCONTROL, flight operator, States*)
 - **recovery** of air navigation services **cost**



Flight profile



Flight phases: *from gate to gate*



Push back from departure gate



Taxiing



Take off



Climb

Cruise



Destination gate



Landing



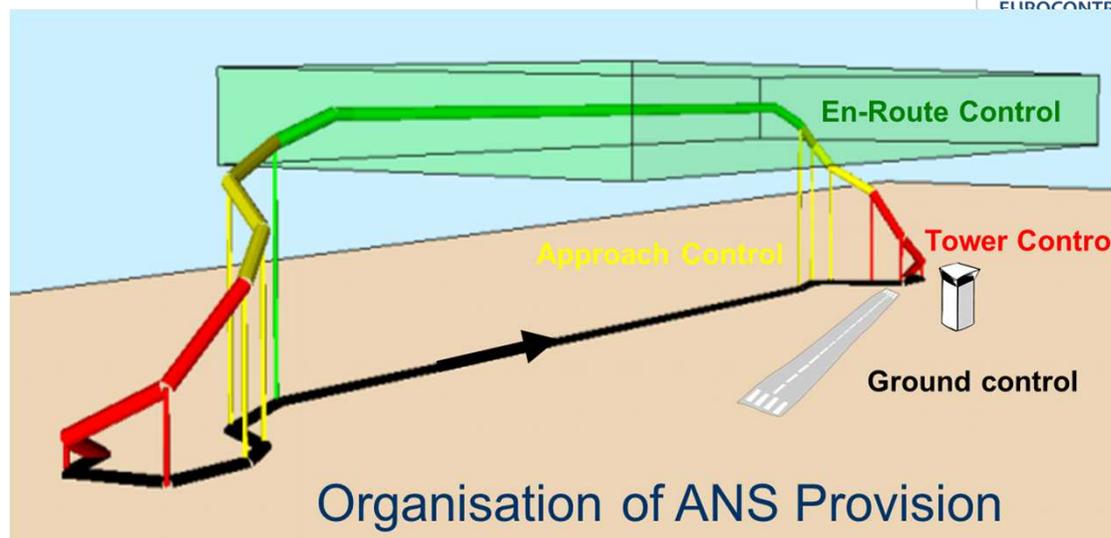
Approach



Descent



Flight phases



8



Route network

Route network
Political borders
Control Areas
Control Sectors



Les positions de contrôle – ancienne version



Du strip (infos vol papier) au striplless



A new environment – Automation & COMs



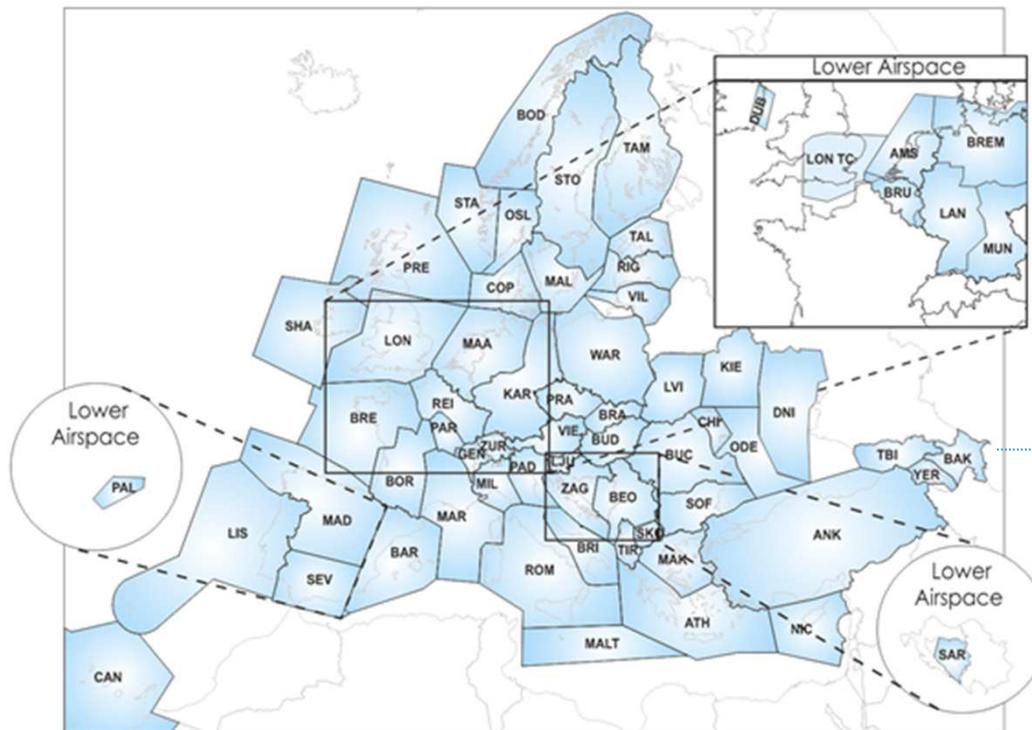
EUROCONTROL



ATM Today Air Transport – Air Navigation - Europe

ICAO: The contracting States recognise that every State has complete and exclusive sovereignty over the airspace above its territory.

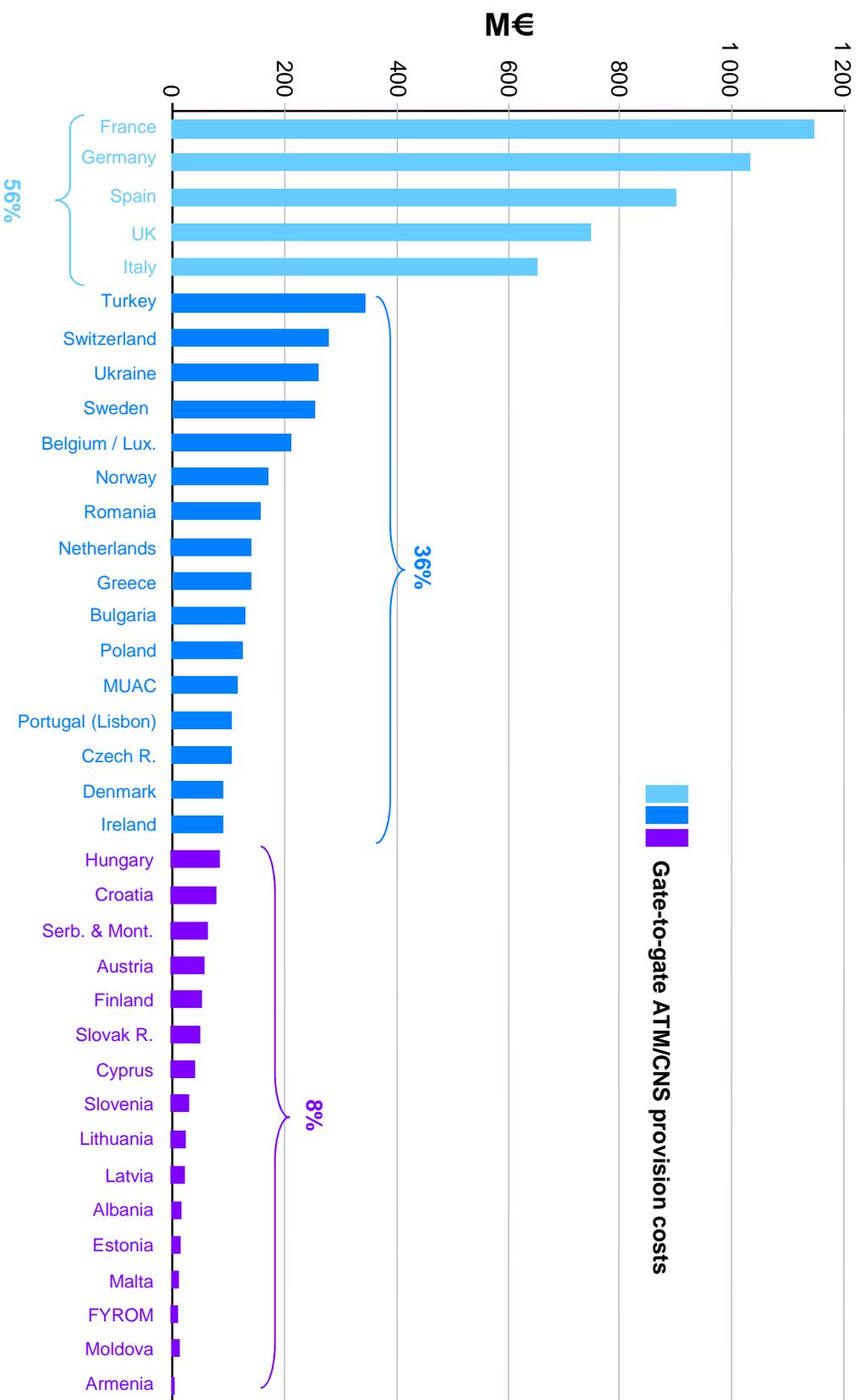
- Approximately 63 Area Control Centres (ACC)
- Over 700 sectors when at full capacity
- Approx. 17,000 Air Traffic Controllers
- Approx. 41,000 other staff



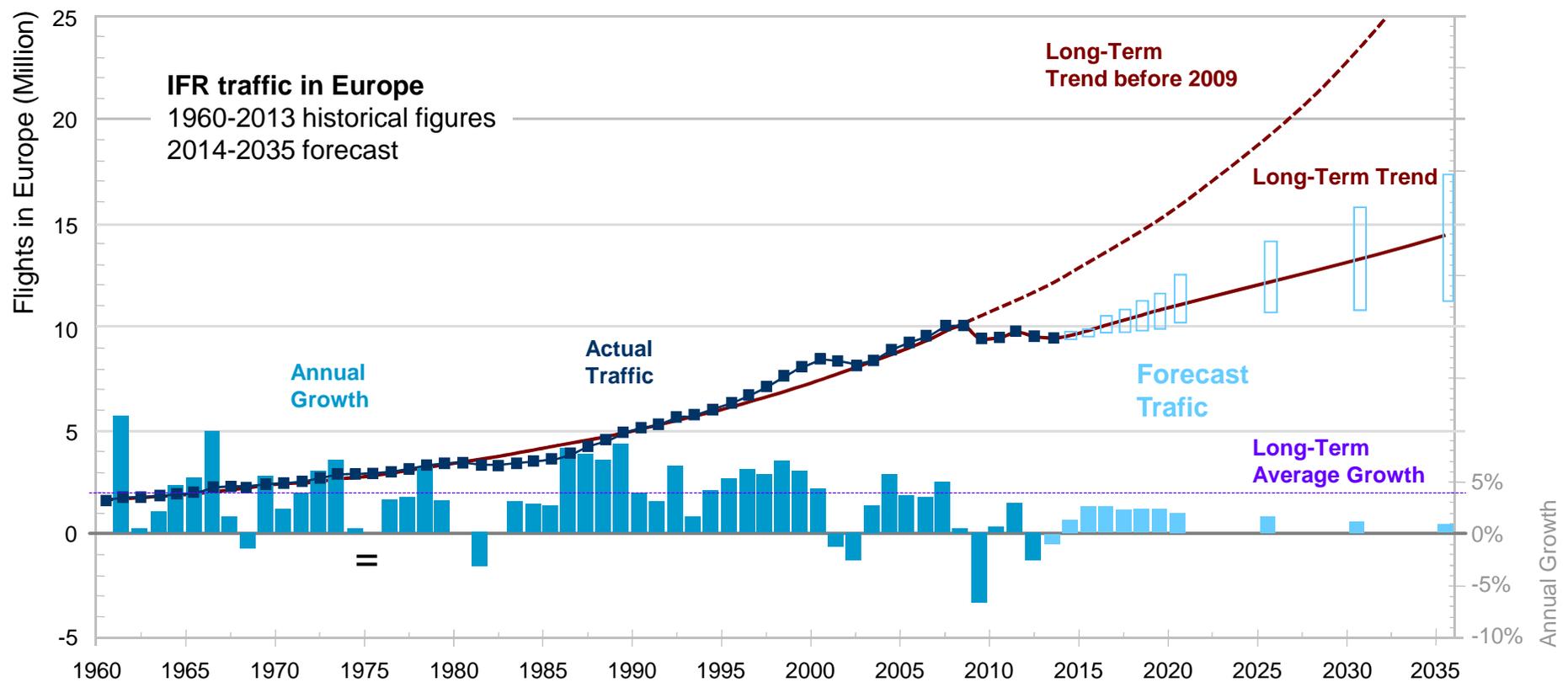
Total Employees 58,000

Total revenue B€8/year

Concentration of costs



Traffic in Europe





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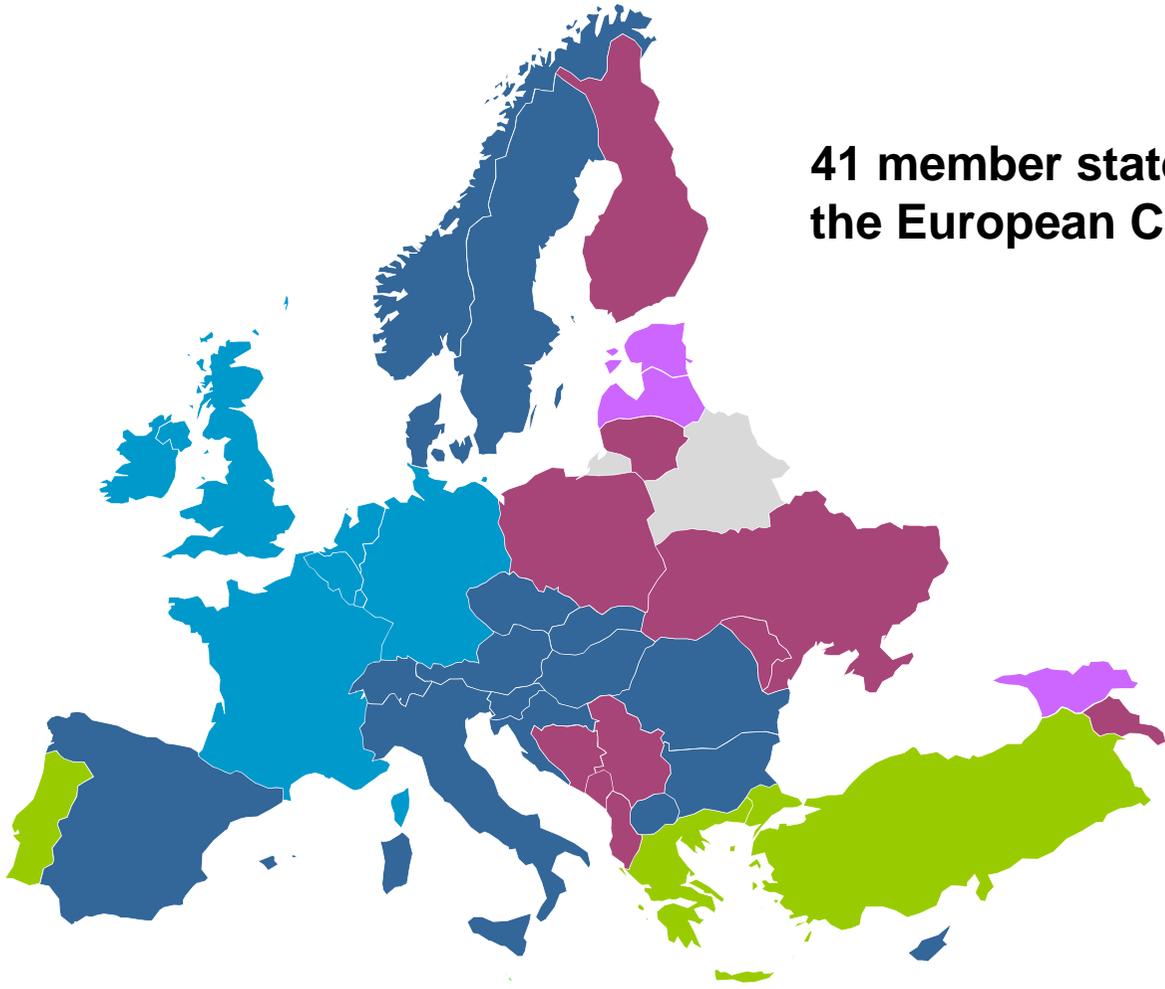


EUROCONTROL – Historique

Philippe Merlo
Directeur ATM

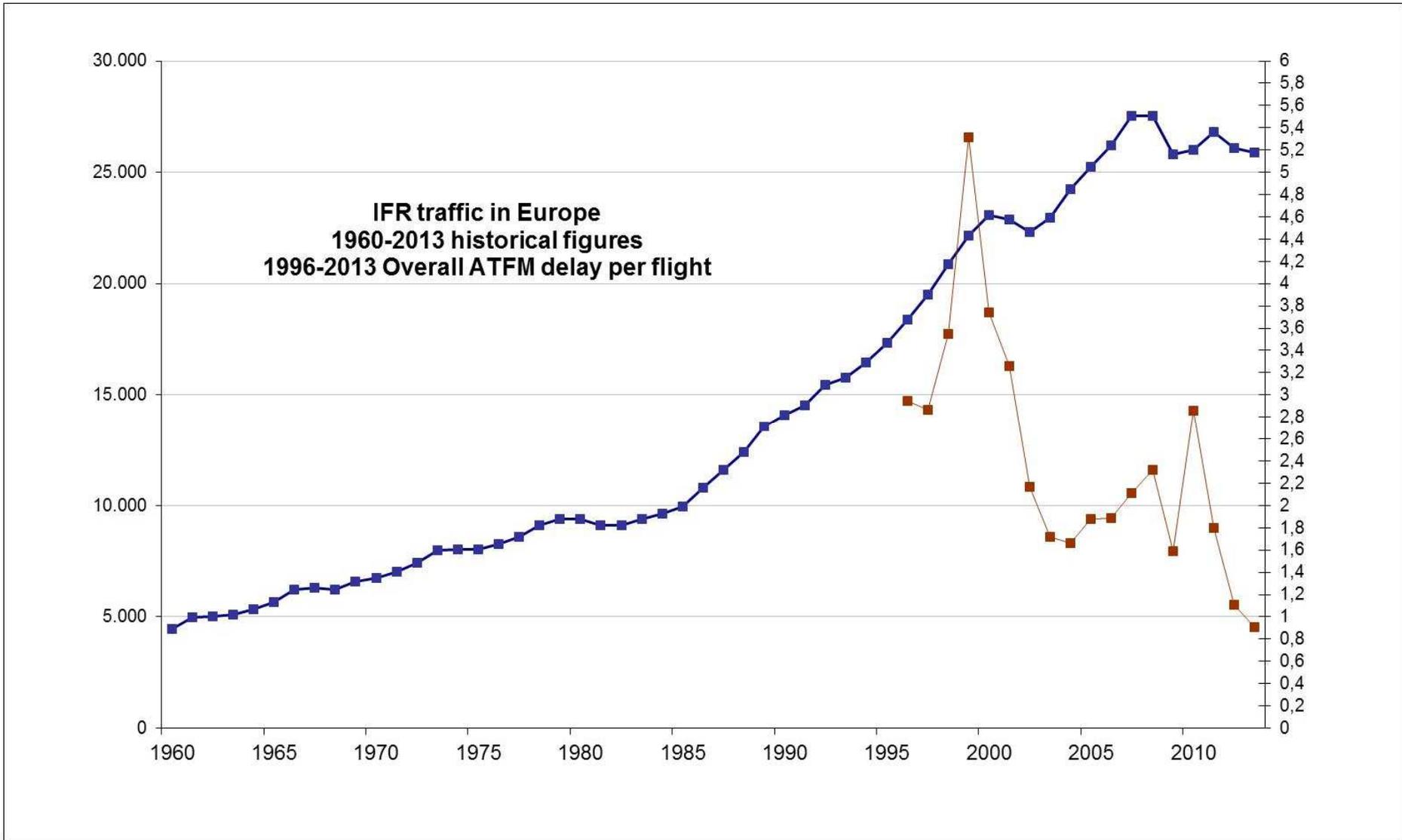
EUROCONTROL – History

- 1960s
- 1980s
- 1990s
- 2000s
- 2010s

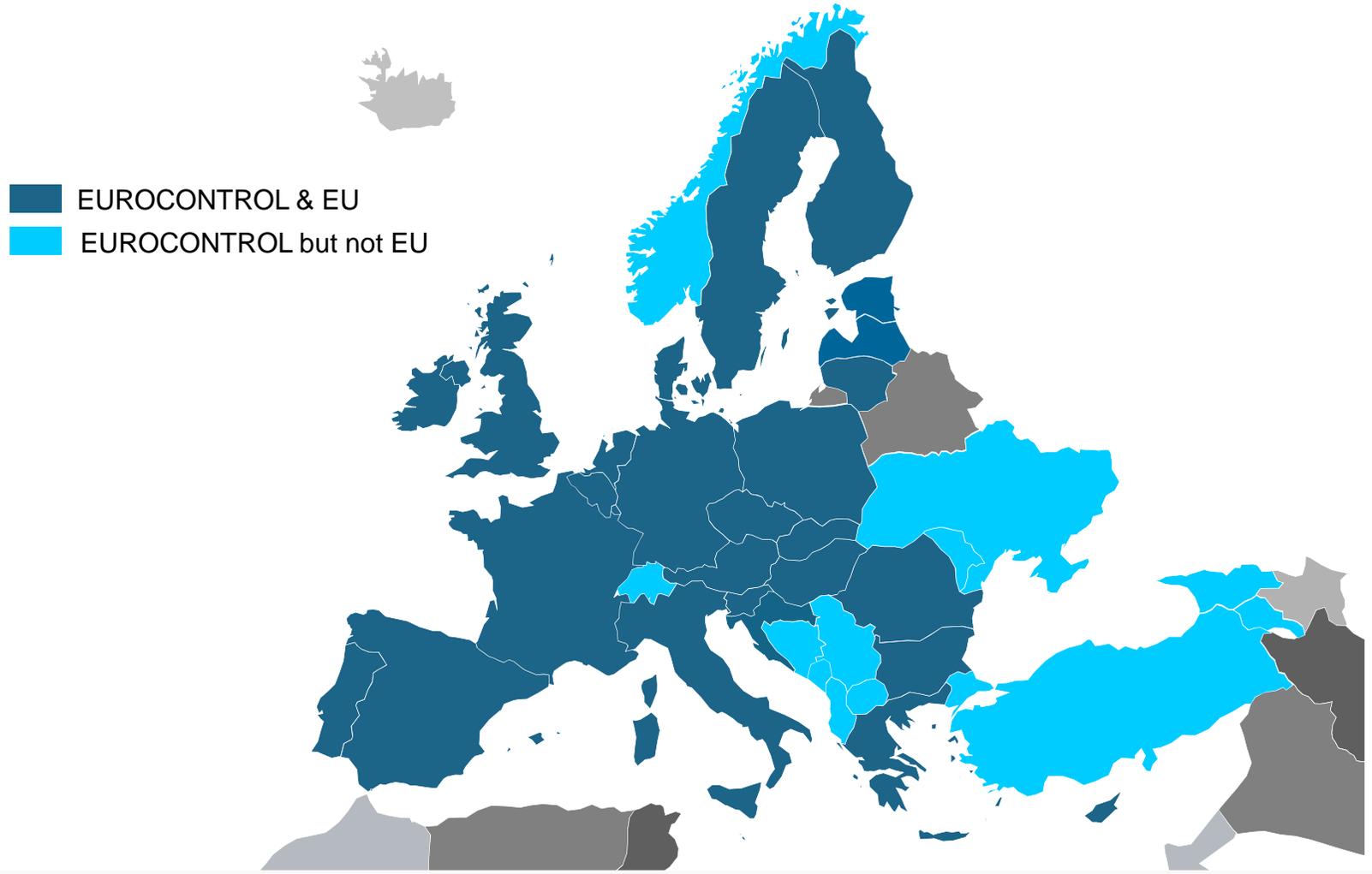


41 member states & the European Community

Challenging times



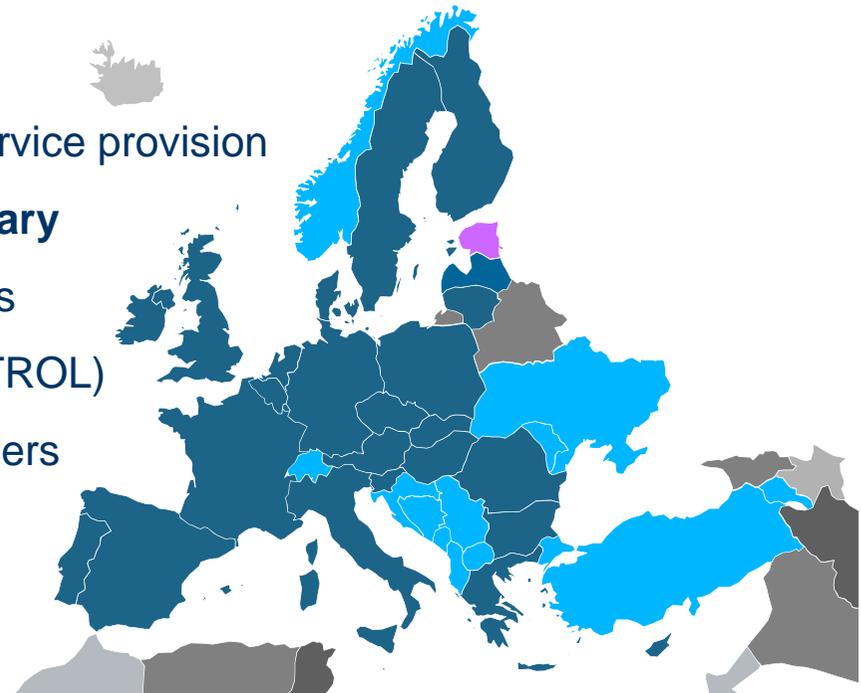
EUROCONTROL members



European ATM & ANS in Figures (2012)



- States: **40**
- Separation between regulatory oversight and service provision
- Air Navigation Service Providers: **civil and military**
- Control: **68** Centres; **670** Sectors; **+/- 430** Towers
- Capacity and flow management: **1** (EUROCONTROL)
- Airports: 100 with more than 3.5 million passengers
- Air Traffic Controllers: **16.700**
(60% in en-route control centres)
- Support staff: **40.000**



Flexible use of airspace



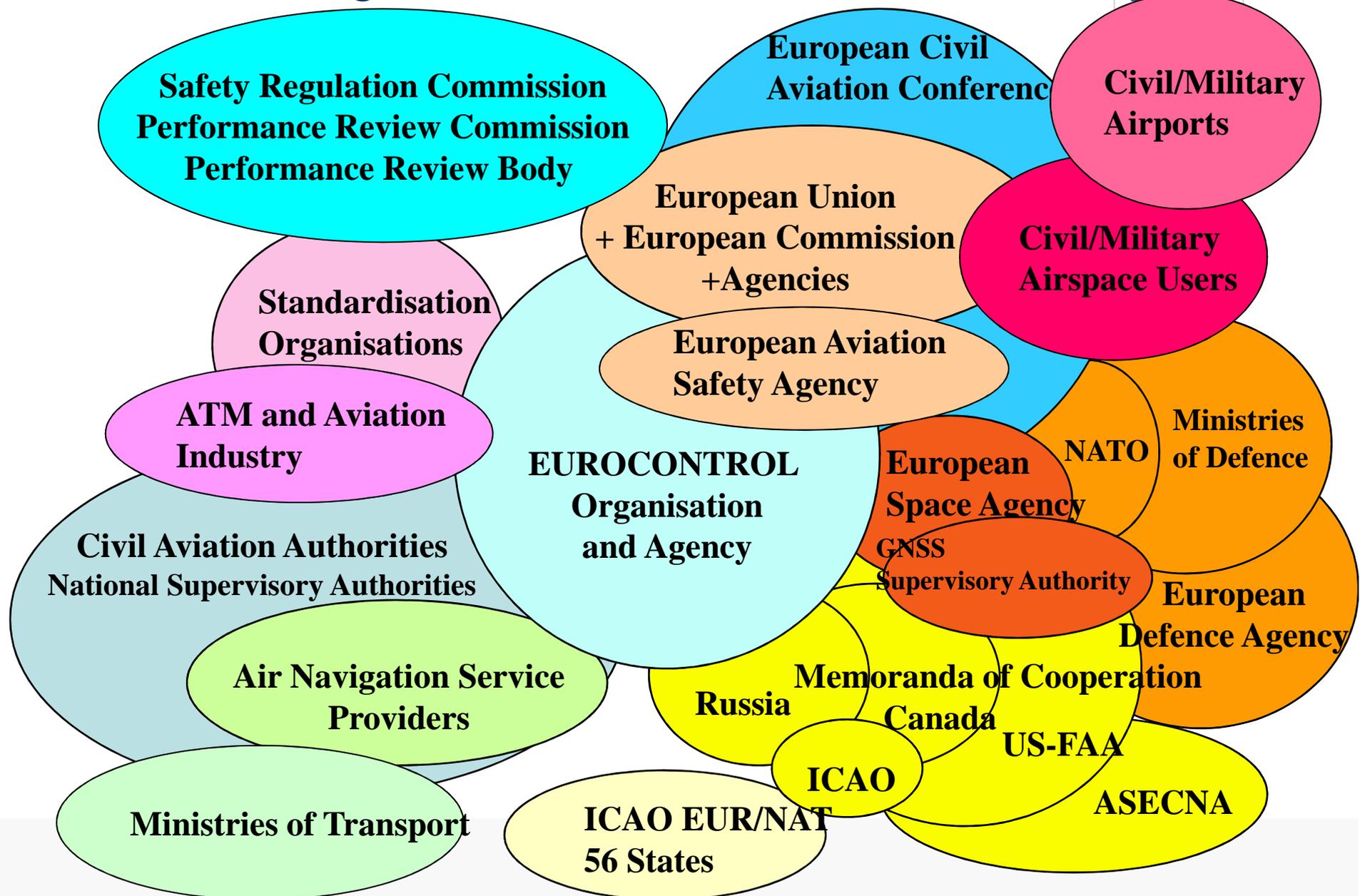
From this.....

.....to this





Air Navigation Main Stakeholders





La force de notre réseau : une dynamique solidaire



Le rôle de l'Union Européenne

Philippe Merlo
Directeur ATM

Single Sky Rationale



Regulatory initiative taken by European Union (EU) to DEFRAGMENT the European ATM system with EUROCONTROL invited to support the European Commission (executive arm of the EU)



Single Sky

❑ Applicability: 36+ States

28: EU

2: Norway, Switzerland (EFTA)

1: Iceland (also EFTA but outside ICAO EUR region)

5: Albania, Bosnia & Herzegovina, Montenegro, FYROM, Serbia (ECAA)

❑ Scope:

- General regulatory framework (who does what)
- Specific regulations in
 - service provision
 - airspace management
 - all operational and technical aspects of ATM contributing to interoperability

Single Sky does not relate not to commercial aspects of air transport

- From political orientation towards efficient implementation -

European Union (EU): political impetus



- **Treaties**, like
Rome Treaty (1957)
Lisbon Treaty (2007)

European Commission (EC): executive arm of EU
(excluding military aspects)



+ EC/DG Enterprise+ ESA

- **Policies**, like
Transport Policy
Space Policy
- relevant **Initiatives** like
Single Sky

EUROCONTROL: intergovernmental organisation
(including military aspects)



- **Expert support**
like **support to Single Sky** implementation

Support is comprehensive, requires **coordination**

- ICAO, EC, States / CAAs, Air Navigation Services Providers, Airspace Users, Airports, Military, Industry, Standardisation organisations, etc.



→ **EUROCONTROL:**
Focal expert organisation for Single Sky

SES II - 'Pillars'

- 1. A Single Safety Framework**
- 2. Regulating Performance**
 - Performance Scheme
 - Functional Airspace Blocks
 - Network Manager
- 3. New Technologies**
- 4. Managing Capacity on the Ground**



Performance Scheme

Functional Airspace
Blocks

SESAR &
the SJU

Network
Manager

Performance Scheme

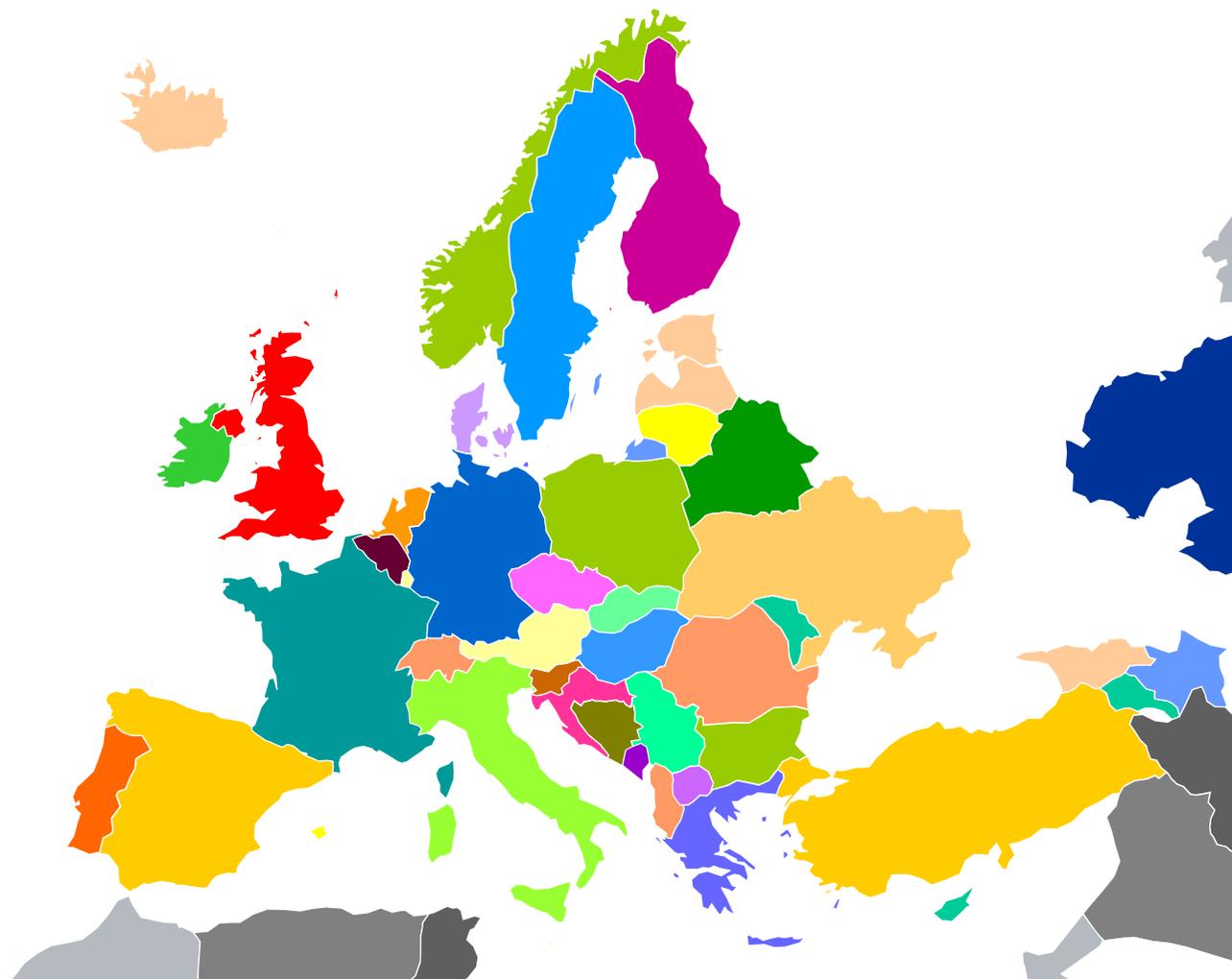
- **Main feature**
 - Key Performance Areas (KPA) and Indicators
 - On safety, the environment, capacity and cost-efficiency
 - European targets
 - National/FAB Performance Plans
 - Periodic review, monitoring and benchmarking
 - Performance Review Body to assist the EC

- **European and local targets set for three to five years**
 - Reference Period 1: 2012-2014
 - Reference Period 2: 2015-2019

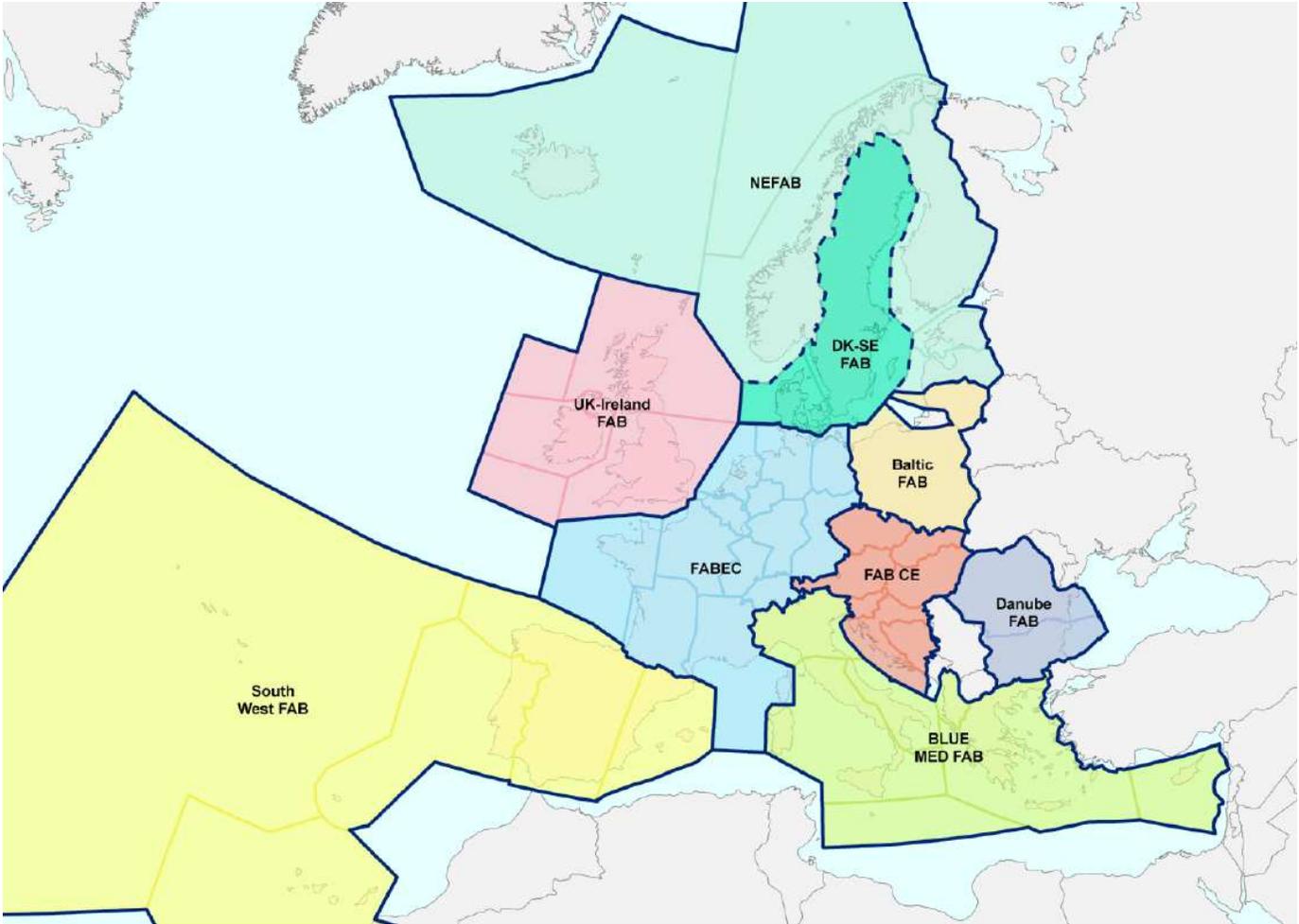
KPIs for EU-wide targets in RP1

Key Performance Area	Key Performance Indicator for EU-wide target setting
Safety	No EU target in RP1 Safety ensured through EASA Monitoring of performance indicators
Environment	Horizontal en route flight-efficiency (% additional distance)
Capacity	En route ATFM delay (Minutes per flight)
Cost-efficiency	Unit price (Average determined en-route unit rate)

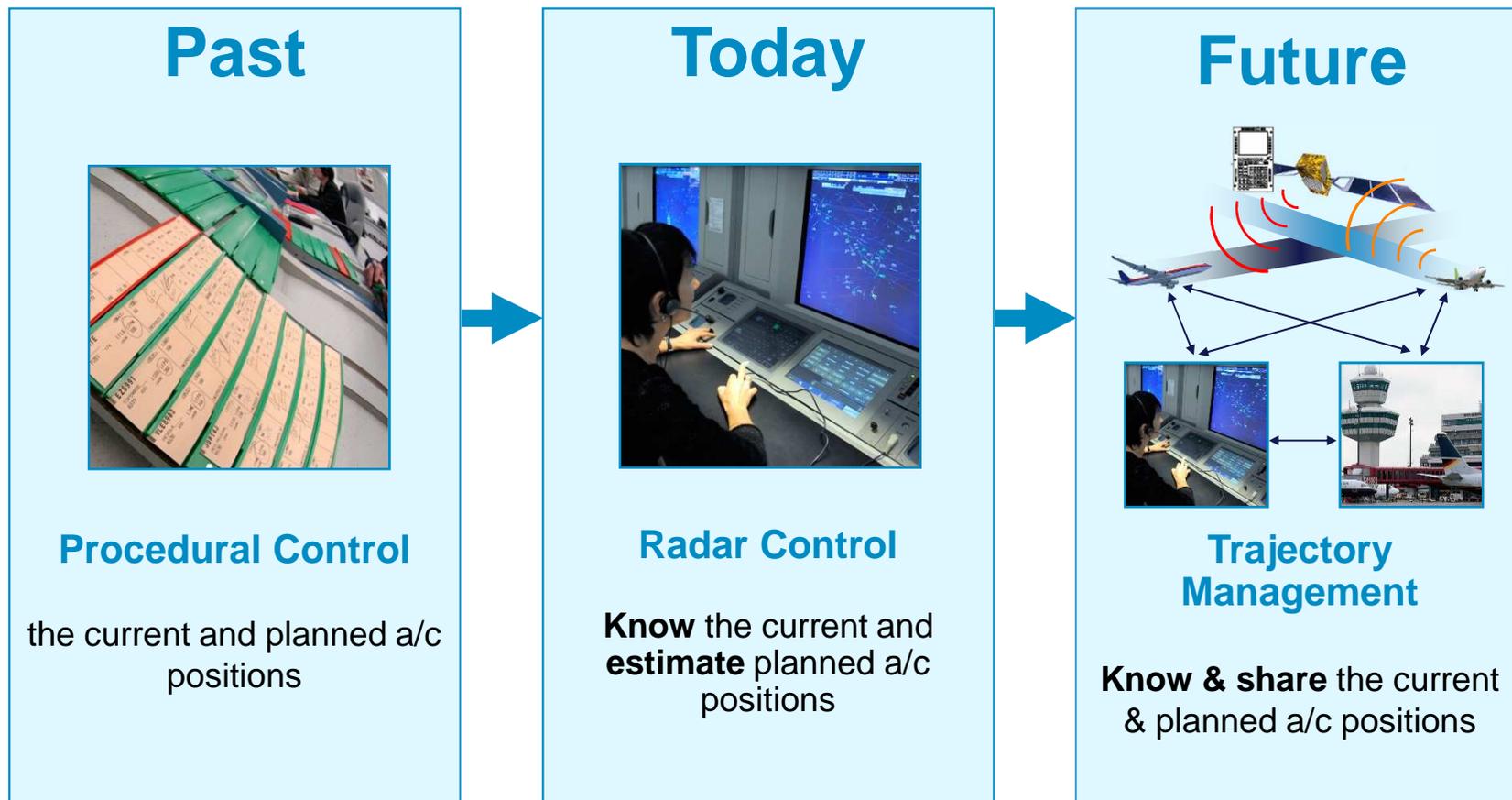
Fragmentation



Defragmentation – FABs



SESAR Concept of Operations is a Paradigm Shift for ATC





Satellite based Communication & Navigation

Advanced Flexible Use of Airspace

Complexity Assessment & Resolution



Cruise climb

Collision Avoidance Monitoring

Airborne Spacing & Separation



Extended AMAN

Time based separation
Point Merge
AMAN & Point Merge



Business & Mission trajectory
Trajectory Management Framework
Trajectory authorisation & revision using datalink



Performance Based Navigation
Cruise climb
Free routing



Approach Procedures with Vertical Guidance

Optimised RNP

Low Visibility procedures using satellite GBAS

Enhanced situational awareness

Integrated Departure & Arrival Manager

Integrated Controller Working Position

Dynamic vortex separation
Continuous Climb & Descent

Pilot Enhanced Vision



Arrival & Departure Management

Ground safety nets
Surveillance
Ground System Enhancement

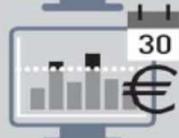
Enhanced situational awareness
Brake to vacate
Surface planning & routing

Remote Tower

Network Management



Advanced Flexible Use of Airspace
Enhanced ATFCM Process



User Driven Prioritisation Process



Airport Operations Planning
Network Operations Planning

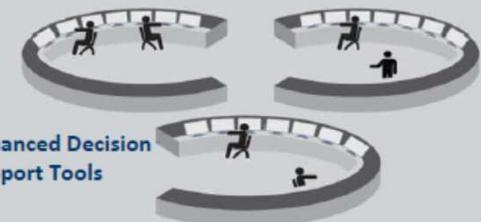
System Wide Information Management



System interoperability with air & ground data sharing

Sector Team Operations

Enhanced Short Term Conflict Alert
Conflict Detection & Resolution
Integrated Controller Working Position



Enhanced Decision Support Tools

SESAR Joint Undertaking

- **Public-private partnership** to manage the SESAR Development Phase
 - Execute the European ATM Master Plan
 - Work with the Deployment Manager on the Deployment phase
 - One single ATM R&D programme in Europe
 - Innovation from private sector
 - Public financial stability & enforcement power

■ **2 founding members:**



■ **15 industry members:**



■ **Being extended until 2024**

Where we go

A Single Sky, more and more:

- Performance driven
- Responsive to new requirements, like UAS (*par exemple drones*)
- Managed as a network, gate-to-gate
- Pan-European (extension to other States)
- Based on new technology, still human centric



More pictures at www.najaco.com





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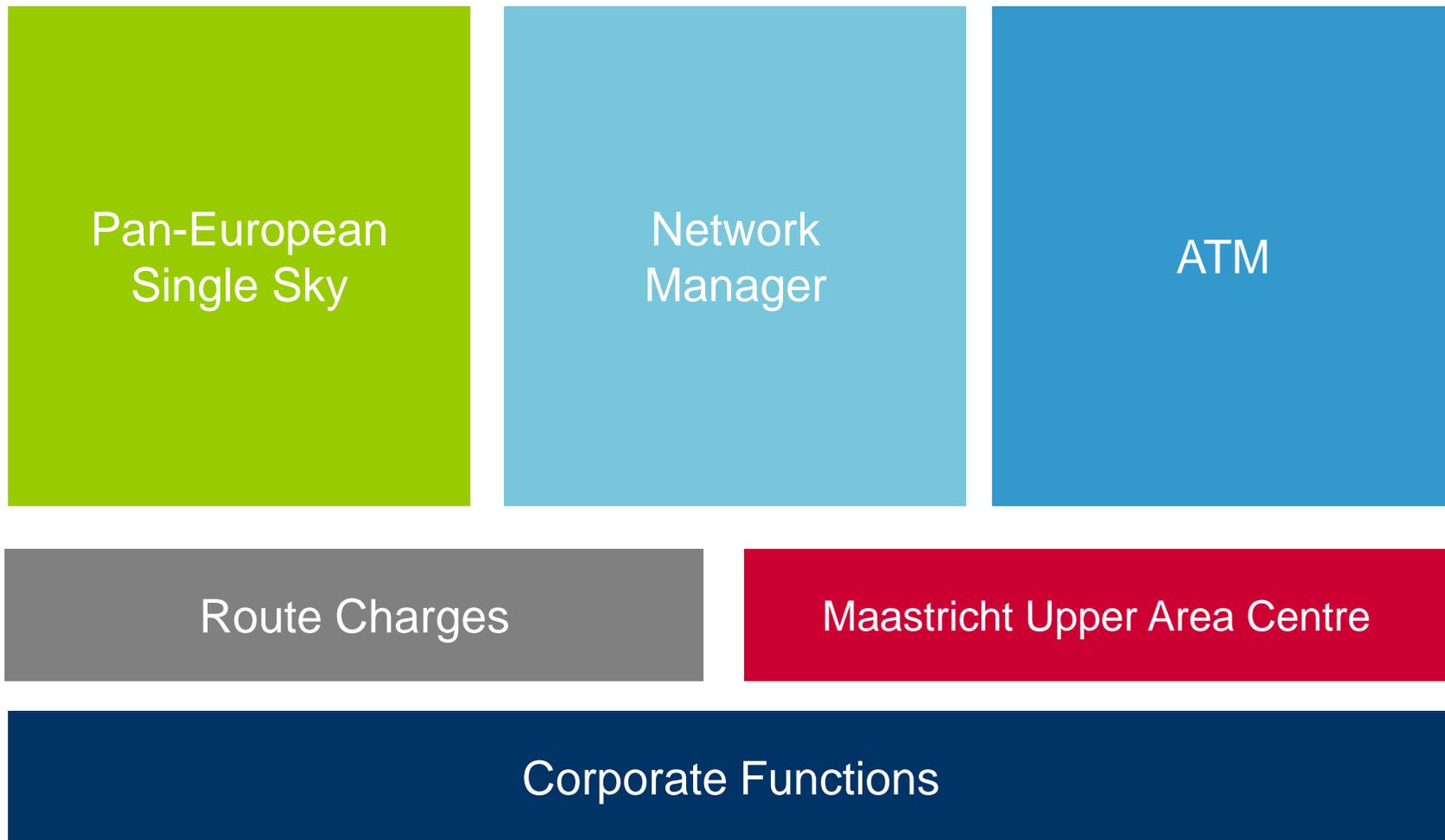


EUROCONTROL – Au présent

Philippe Merlo
Directeur ATM



EUROCONTROL – Structure

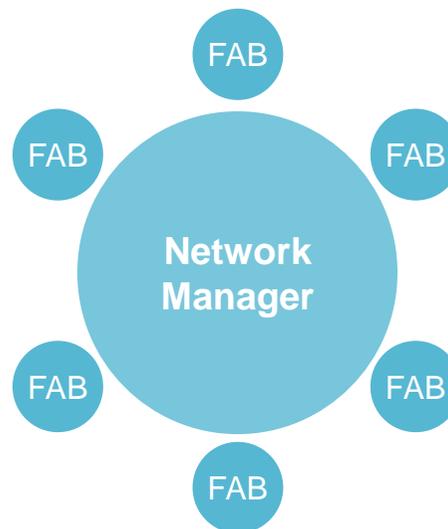


ATM in Europe – looking forward

Regulate



Operate/Coordinate



Research



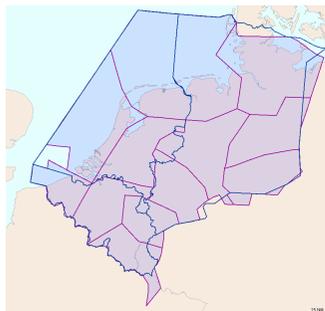
EUROCONTROL
role

Technical support
Performance review

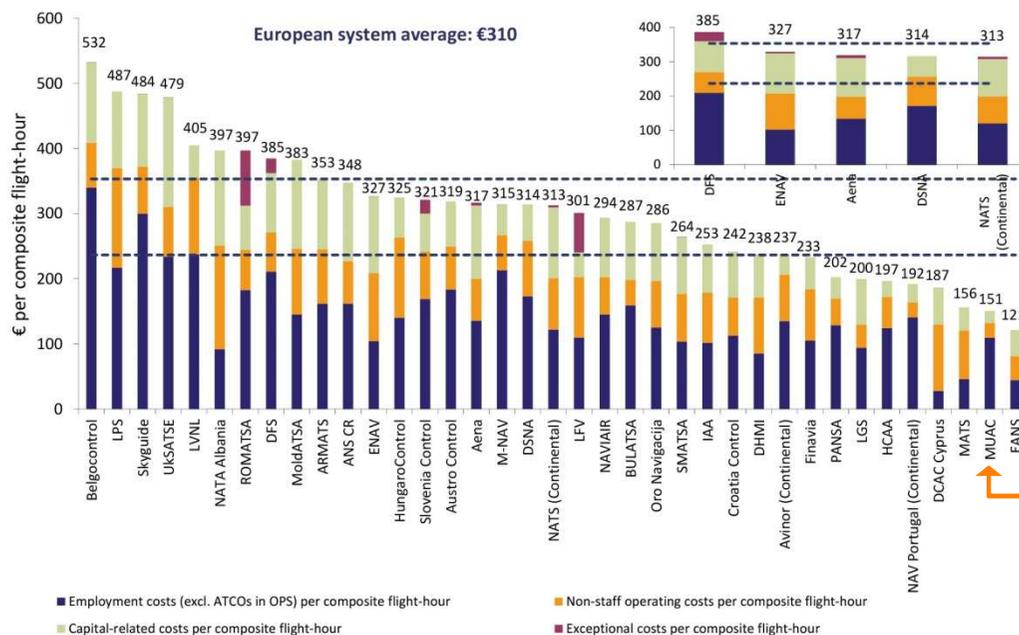
Network management
Deployment coordination
Route charges

Founding member
Major contributor
Longer term research

Maastricht Upper Area Control Centre



- 260,000 km² extending over Belgium, the Netherlands, Luxembourg and North-West Germany
- More than 1.5 million flights controlled (2013)
- Annual costs (2013): € 138 M



- 3rd largest control centre in Europe
- 6th largest ANSP in Europe
- Highest controller productivity in Europe

One of the most cost-effective ANSPs

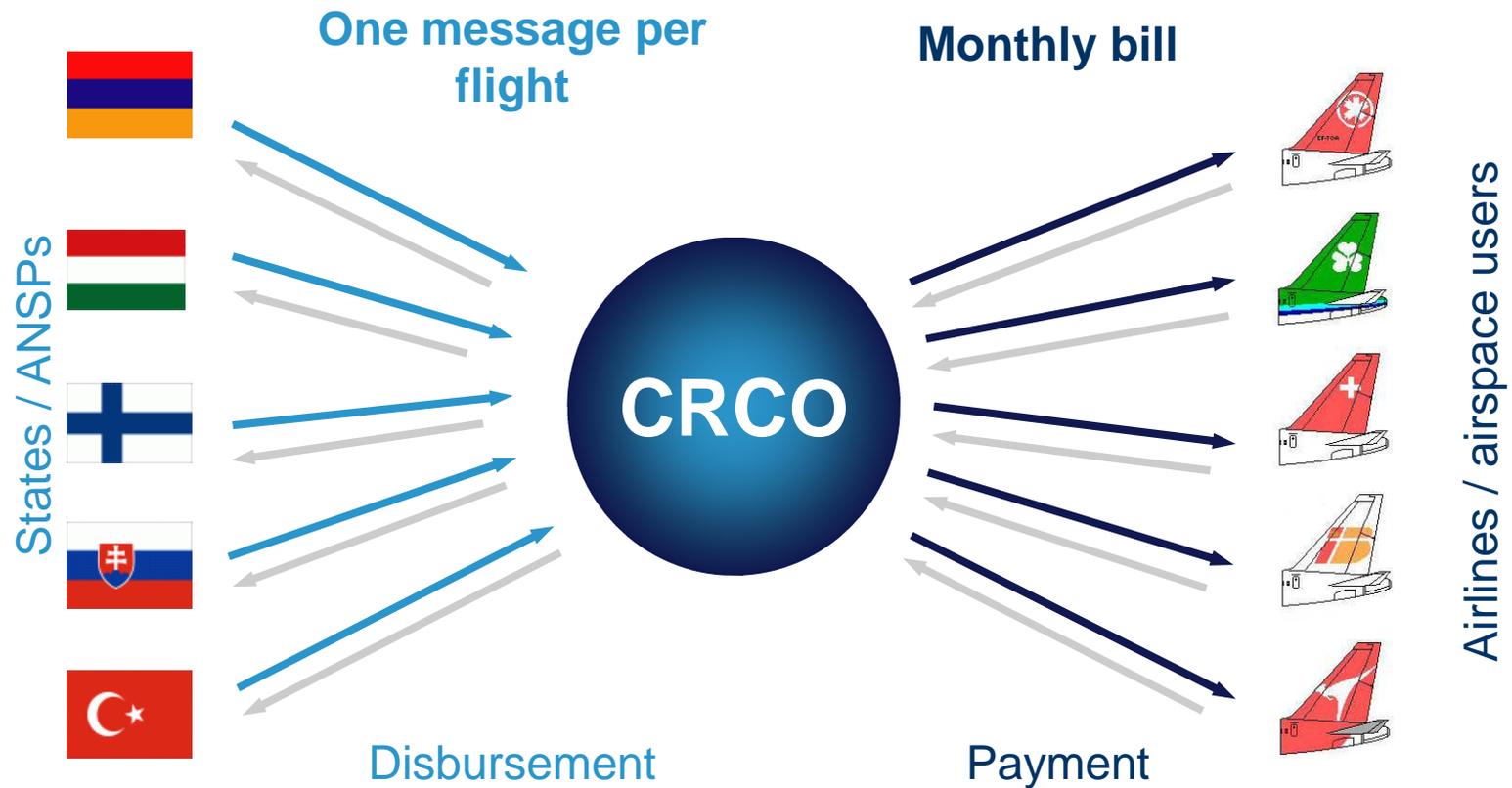
Maastricht Upper Airspace Control Center



Central Route Charges Office

- Collects air navigation charges on behalf of States across Europe
 - En-route
 - Terminal
 - Communication
- Pan-European service
 - Simple, equitable and transparent for airspace users
 - Quick, efficient and cost-effective for States/ANSPs
- Over 7,1 billion € collected annually
- Collection cost of less than 0.3% of amounts billed

The Route Charges System





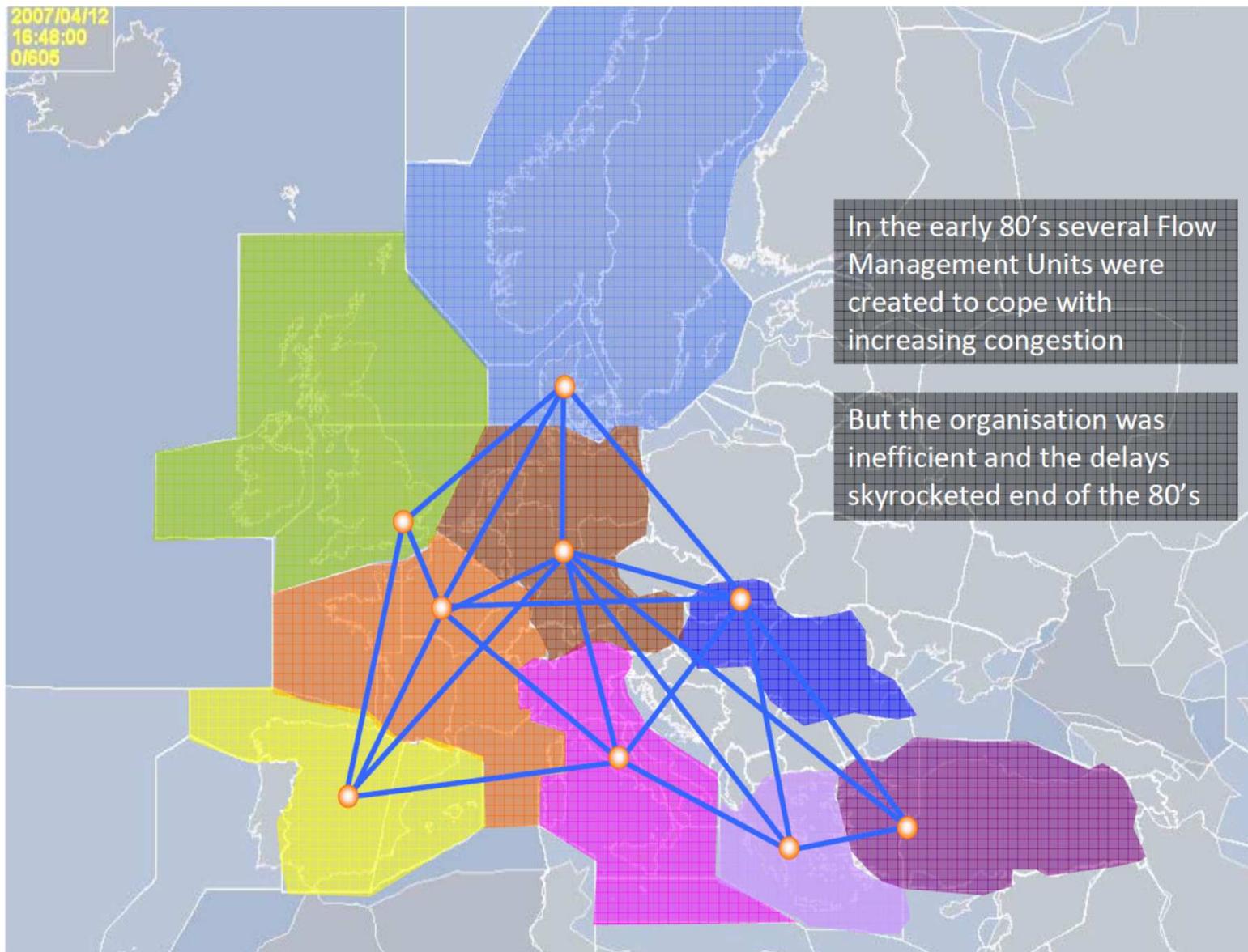
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Introduction à la visite de la salle opérationnelle du Network Manager

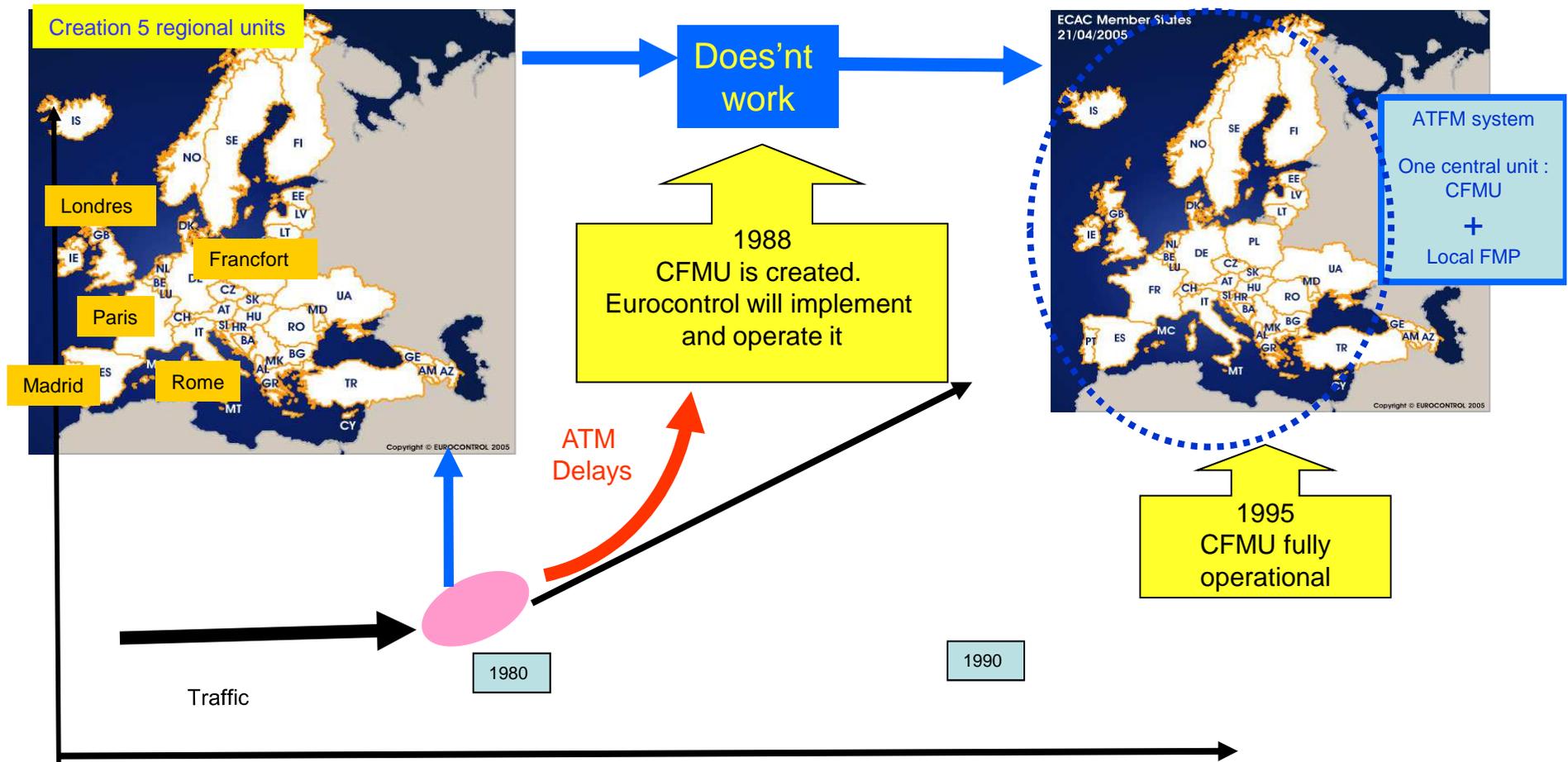
Philippe Merlo
Directeur ATM

Historique CFMU



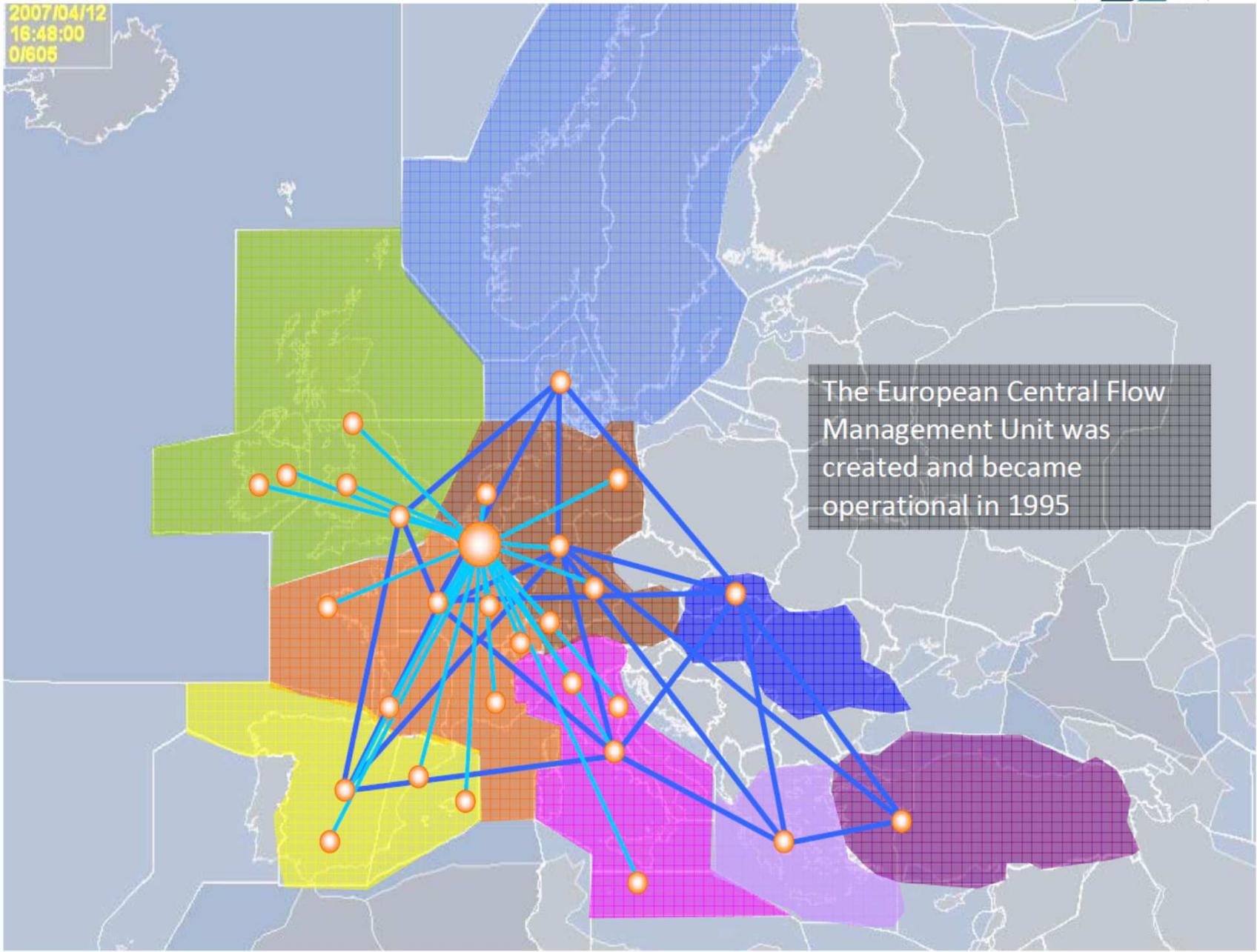
Back in the 1980's : Major European ATM crisis Creation of CFMU

EUROCONTROL





2007/04/12
16:48:00
0/606



2007/04/12
16:48:00
0/605



30000 Flights every day

1 Flight Plan processed every 3 seconds

And above 60000 Flight Plan electronic messages every day

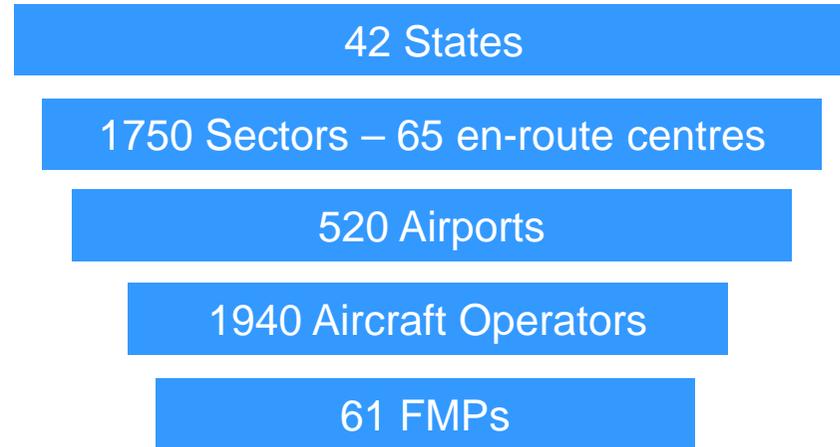
90% of messages processed automatically

Important milestones

- **2007** New CFMU Ops room inaugurated
- **2008** Industrial action
- **2009** Concept of network operations launched
- **2010** Volcanic ash crisis key role
- **2011** CFMU becomes Directorate Network Management
- **2011** EUROCONTROL designated Network Manager by European Commission



One single
Flow Management
System over
Europe



Network Operations



Trois fonctions du CFMU

To know the demand

- FPL
- CPR

Initial Flight
Planning

IFPS plan de vol – guichet unique

To know the infrastructure

- Airport
- in the air
- Capacity

Env & EAD
Aeronautical
Information

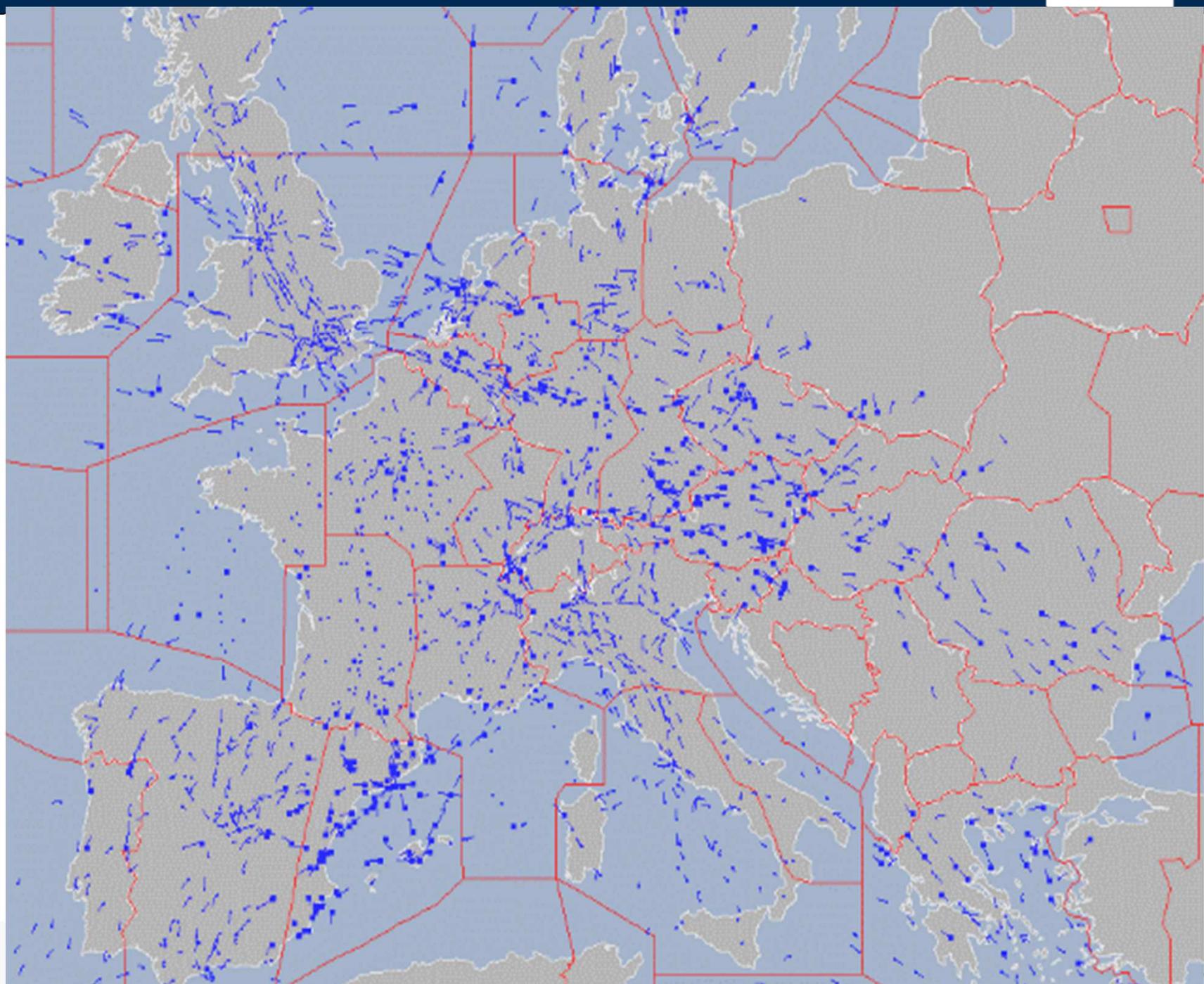
Network Information
Sharing

Représentation de l'espace

To match and manage
(inside the infrastructure)
the demand
&
the capacity

Air Traffic Flow
& Capacity
Management

Régulation du trafic : protection
des secteurs et avions retardés



Et maintenant la visite ..

