Project RoMiAD
Role of Markets in AAS Deployment

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Think Research

Today's Agenda

- Why Project RoMiAD?
- How big is the market?
- What are the benefits of virtualisation?
- How can the transition be incentivised?

Why Project RoMiAD?

Project RoMiAD investigated the market aspects of the transition to a distributed architecture

Market size → Benefit mechanisms → Scenario analysis → Incentivising the transition

Regulation	• Achieves best in class performance
Collaboration	• Achieves economies of scale (dependent on scope of collaboration)
Competition	• Achieves commercial price

Scenario 0	• Baseline
Scenario 1	• FABs Alliances
Scenario 2	• Regional Alliances
Scenario 3	• Pan European Common Data Layer
Scenario 4	• Pan European Common Data and Physical Layers
Scenario 5	• Pan European Services

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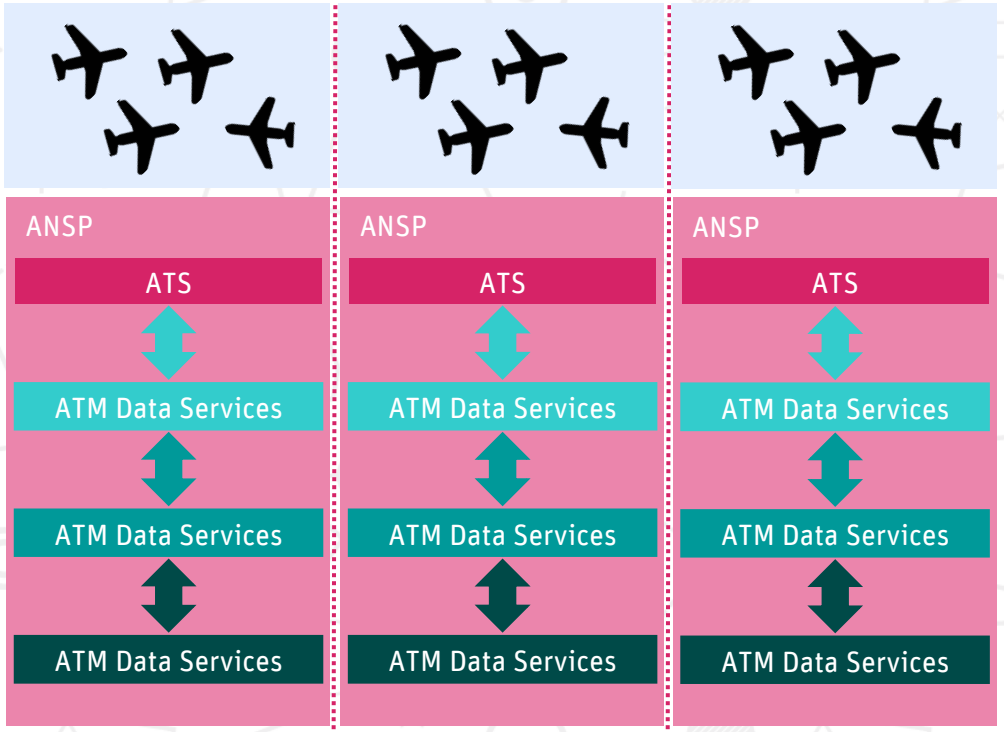
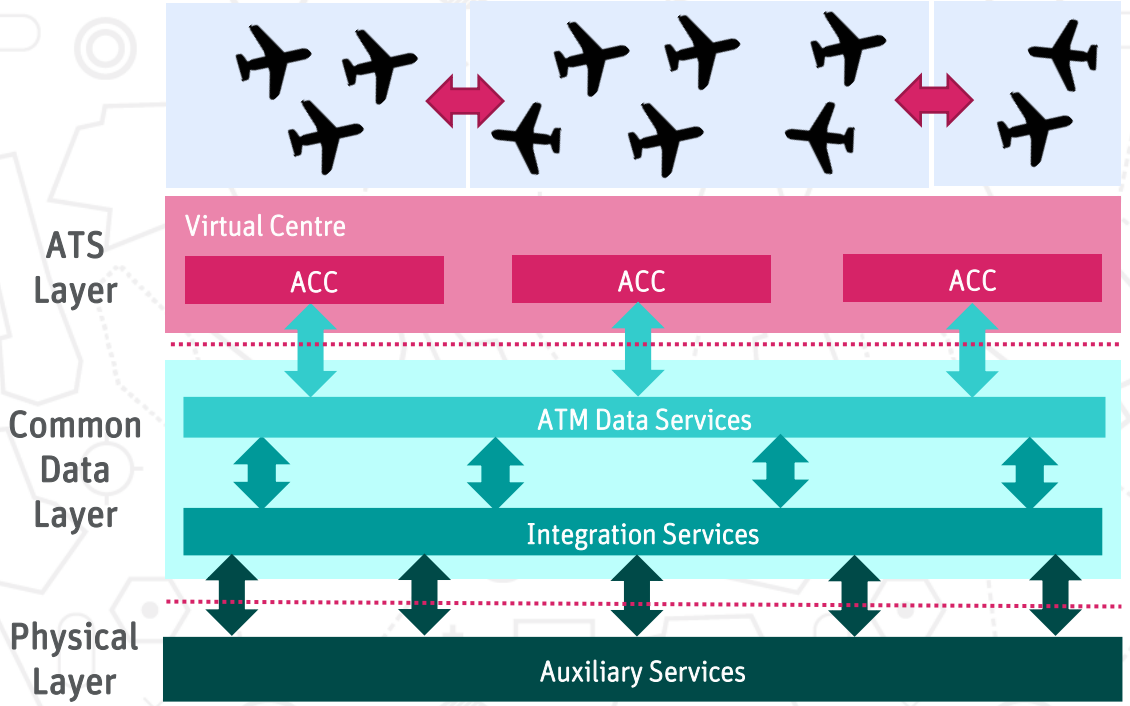
We started with the proposal of the Airspace Architecture Study

Current architecture



AAS proposed architecture



Virtual Centres provide geographically independent ATS

Virtual Data Centres provide a common data layer providing ACCs access to all relevant data

Rationalisation of CNS, AIS and MET

And defined how the proposals could be achieved

Based on the AAS transition plan supporting actions by early adopters to help refine the definitions of ATS and ATM data services.

STEP 1: Rationalise

- Operational Excellence
- Pre-defined Capacity Sharing
- ADSP Rationalisation
- CNS Rationalisation

STEP 2: Harmonise

- Dynamic capacity sharing
- Contingency
- ADSP Commercialisation
- CNS Consolidation

STEP 3: Innovate

- Increased automation
- Additional data services
- CNS deployment

SWIM Enabled Current Technology → Identifies services for → Cloud Based Services → Creates baseline for → Increased automation

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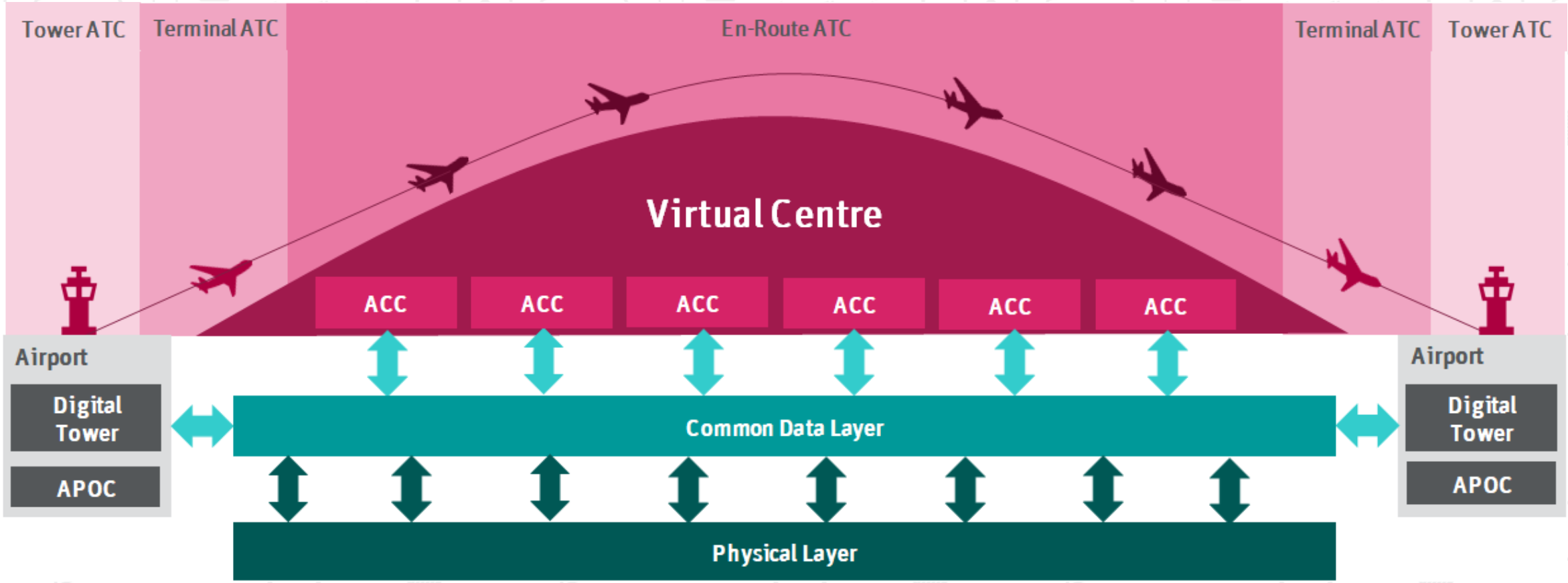
To deliver the Digital European Sky

Fully integrated ATM, agnostic in organisational terms, that is sufficiently harmonised in terms of infrastructure and concept of operations to allow significantly lower costs for operating the system and introducing new functionality.



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How big is the market?

The we defeind the different potential markets

ATS Layer

ATS Services

Excludes ATM Data Services

Common Data Layer

ATM Data Services
(including Integration Services)

Currently Part of ATS

Physical Data Layer

Auxiliary Services
(including CNS, AIS, MET)

Ground-Ground Comms
Transversal Services (SWIM Services, Cyber Security)

Network Functions

And focussed on understanding the three main markets for En-route ATM

ATS Layer

- Multiple ACCs collaborating in Virtual Centres mostly regionally. OPEX heavy.
- Current estimated value:
  €3.15 Bn
- On current costs:
  - 90% OPEX / 10% CAPEX
  - Requires investment in “harmonised” systems
  - Benefits are additional efficiency (increased capacity) and reduced buffers.

Common Data Layer

- Data services in a cloud environment accessible by all stakeholders.
- Current estimated value:
  €1.15 Bn
- On current costs:
  - 75% OPEX / 25% CAPEX
  - Likely to become more CAPEX orientated if operational efficiency exists

Physical Layer

- Specialised providers operating CNS, AIS and MET assets.
- Current estimated value:
  €1.7 Bn
- On current costs:
  - 65% OPEX / 35% CAPEX
  - Likely to become more CAPEX orientated if operational efficiency exists

What are the benefits of virtualisation?

We identified a series of benefits in each layer…

ATS Layer

- Improved ATCO productivity
- Improved ATFM and DCB
- Reducing the capacity buffer.

- Benefits: 60%

Common Data Layer

- Saving costs infrastructure and system is driven by commercialisation of services rather than rationalisation .

- Benefits: 35%

Physical Layer

- CNS rationalisation for legacy assets through pan-European planning
- Improved deployment of new CNS assets

- Benefits: 3%

And for each step of the transition…

	ATS Layer	Common Data Layer	Physical Layer	Total Annual Benefit
Step 1 Rationalise	Operational Excellence Pre-defined Capacity Sharing	Data Systems Rationalisation (equipment sharing via ATM Data as a Service)	CNS Rationalisation (removal of legacy systems)	€ 1,1 B
	€ 500 M – 1 B	€ 22 M – 77 M	€ 27 M – 34 M	
Step 2 Harmonise	Combined FIR	ADSPs commercialisation (used of cloud services)	CNS Consolidation (optimised coverage existing systems)	€ 850 M
	€ 300 M – 500M	€ 200 M – 350 M	€ 18 M – 22 M	
Step 3 Innovate	Capacity on Demand + Increased Automation	Lower cost deployment of Additional ATM data services to enable increased automation	CNS Deployment (deployment of new systems)	At least € 500 M
	€ 350 M – 500 M	TBD	TBD	
Total	Up to € 2 B (60%)	At least € 250 M (20%)	At least € 45 M (3%)	At least € 2 B

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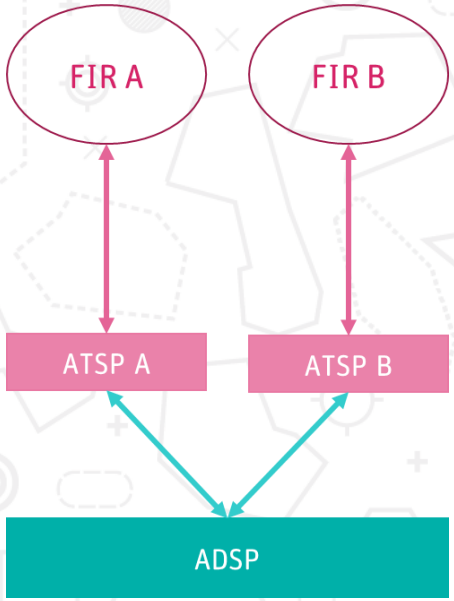
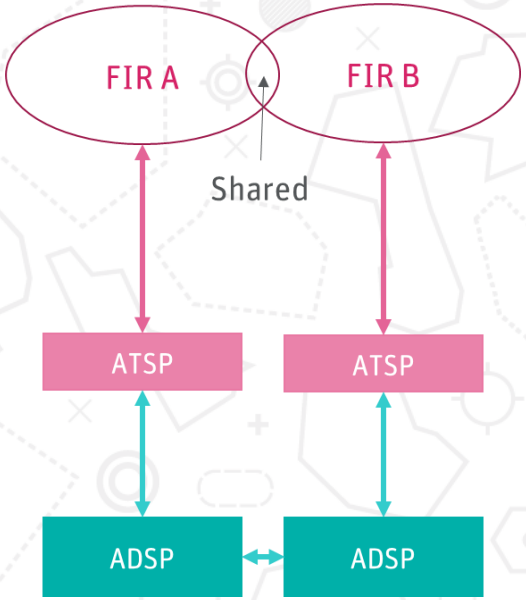
The majority of the benefits are accrued by reducing the cost of capacity through new systems, automation and most importantly collaboration in the ATS layer

No ATS delegation



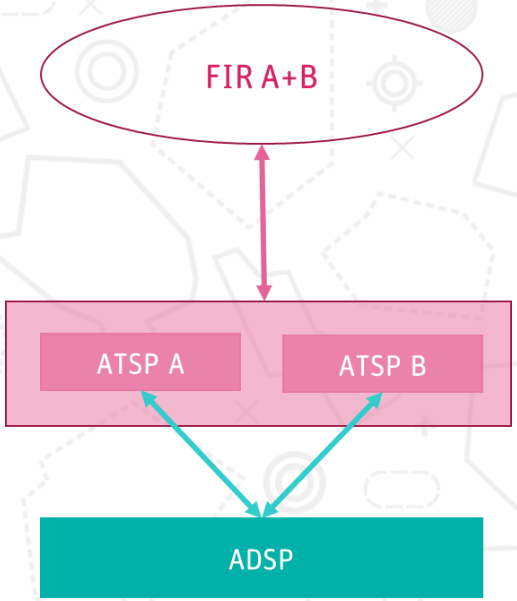
Eg MUAC/Slovenia

Pre-Defined Delegations



Eg FINEST

Combined FIR



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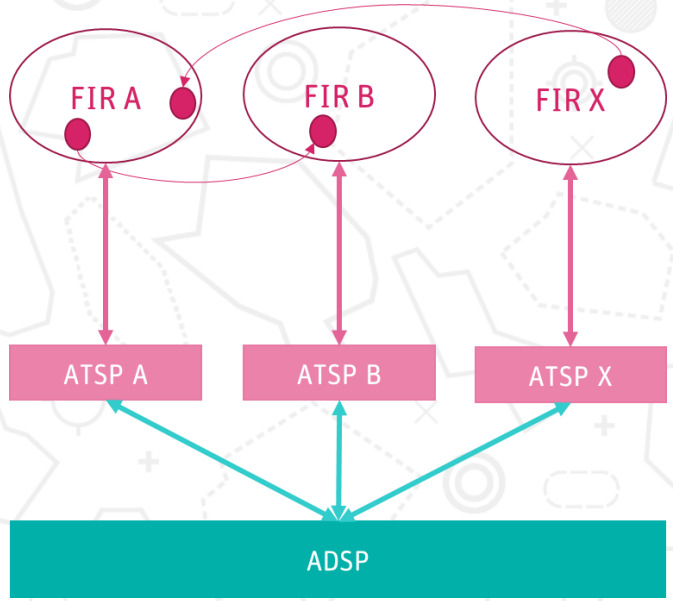
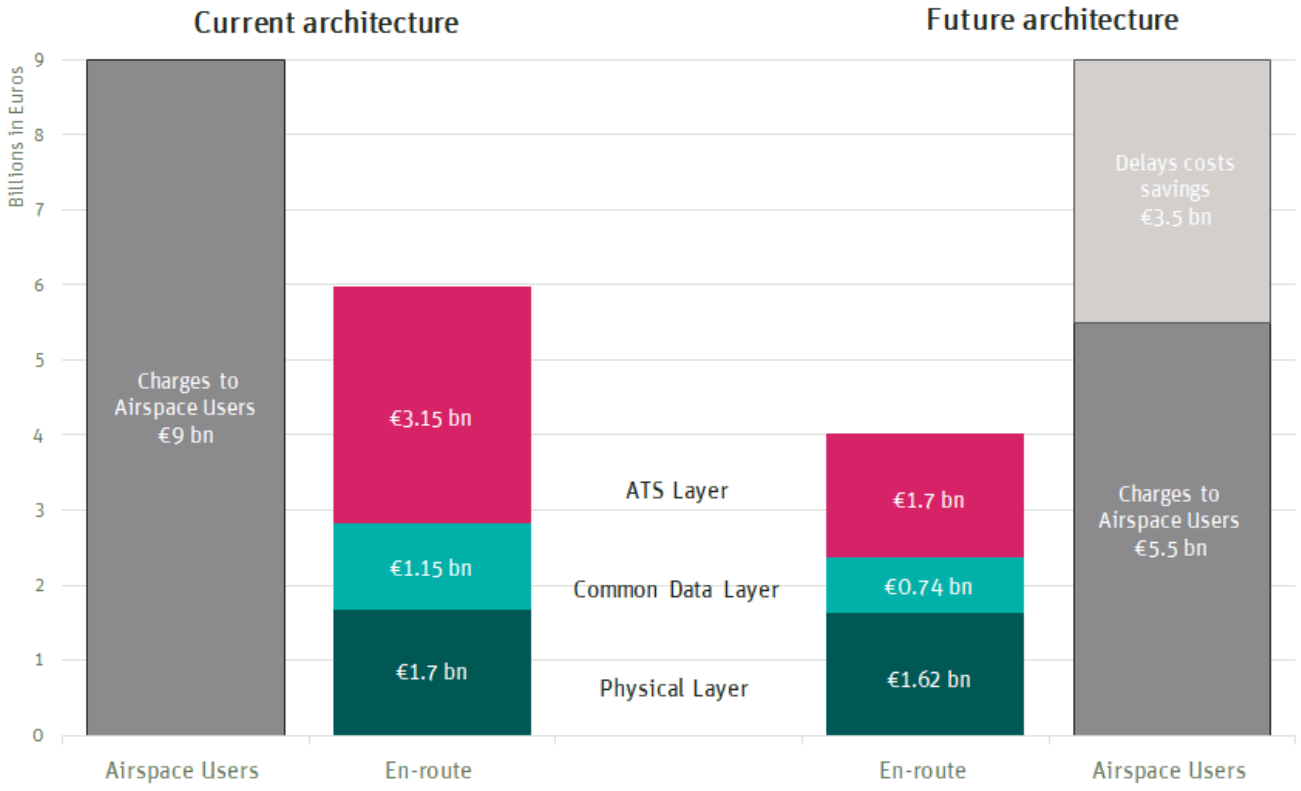
Capacity on Demand



AAS end point

How can the transition be incentivised?

Achieving the Digital European Sky is as much as about new business models as it is new technology



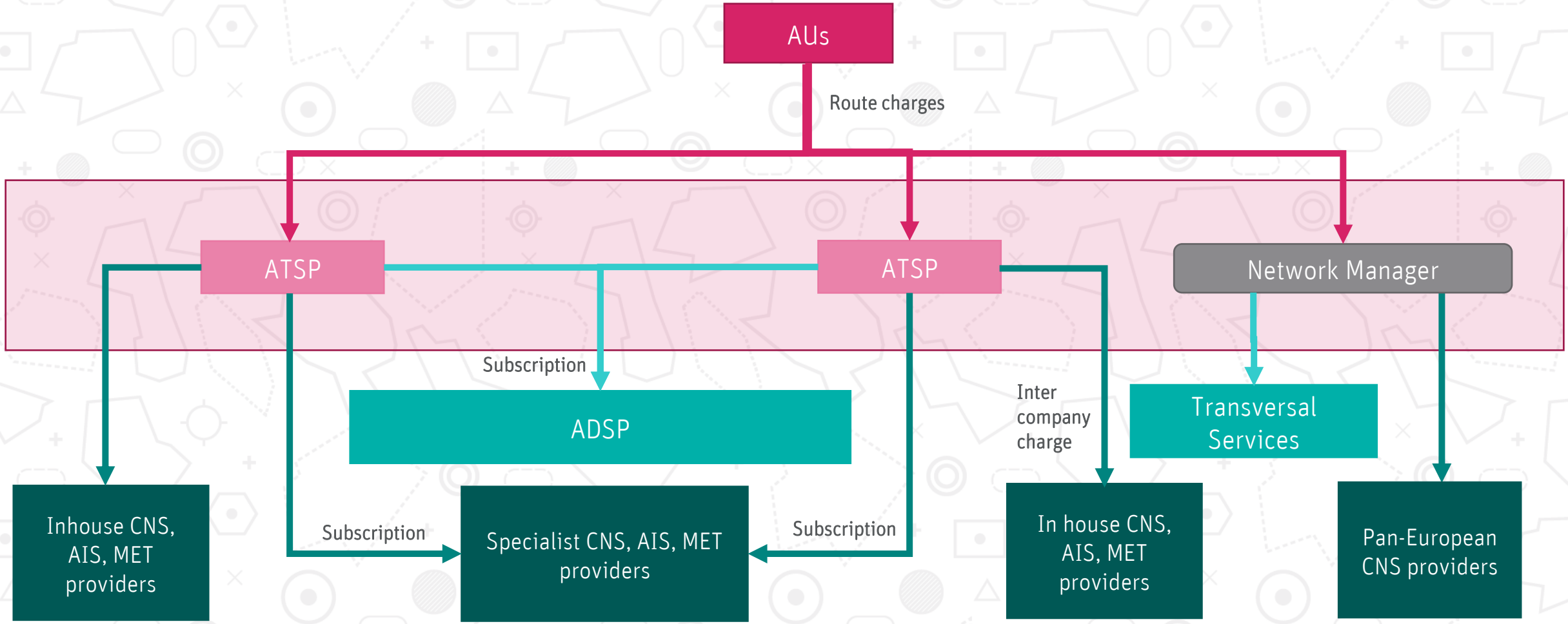
Virtualisation could allow:

- 1/3rd reduction in annual ATM/CNS provision costs
- Reduced delays
- Reduced environmental impact

- Potential to increase traffic up to 3 times without significant delay

- 3.5 bn annual net benefit to AUs from avoiding costs of delays

We need new collaborations within each layer that support scalable and flexible service provision



The ATS Layer: Collaboration between ATSPs and the Network Manager

- Benefits are incentivised by ATSPs collaborating to provide ATS whilst maintaining sovereignty.
- However, capacity and demand services could include competition operated by an EU body.

Existing costs	Rational transformation of costs	Revised costs (Europe wide)
€ 3,150 m OPEX: 90% CAPEX: 10%	Reduction in costs as a result of: • Increased ATCO productivity enabled by Operational Excellence and increased automation. • The reduced capacity buffer that the dynamic capacity sharing enables.	€ 1,660 m (50% reduction)

The Common Data Layer: New ways of sharing risks between ATSPs and system suppliers?

- ADSPs could collaborate and potentially specialise in different types of ATM data service provision.
- Competition, which has been long in the European Commission plans, could lead to two ADSP models:
  - Groups of ANSPs purchase an ANSP system for their entire area of responsibility.
  - ANSPs subscribe to an ANSP system owned and operated by the system manufacturer.

Existing costs	Rational transformation of costs	Revised costs (Europe wide)
€ 1,150 m OPEX: 75% CAPEX: 25%	Initial saving from rationalisation of infrastructure and systems. Further saving from "commercialisation" of ATM data centres.	€ 740 m (35% reduction)

The Physical Layer: Building the right pan-network collaboration to successfully deploy new CNS assets

- Collaboration in the physical layer has two potential benefits:
  - Improved CNS planning due to horizontal collaborations.
  - Reduced maintenance costs due to specialisation of service providers.
- As a competitive market entry barriers would be high. However, a contestable market could be created by outsourcing operations and maintenance but not CNS planning and asset ownership which would be kept under the ANSP/State responsibility and therefore limit the horizontal collaboration benefit.
- Pan-European procurement of commonly agreed new services by the Network Manager or another European body should be investigated as a way on minimising costs.

Existing costs	Rational transformation of costs	Revised costs (Europe wide)
€ 1,680 m OPEX: 65% CAPEX: 35%	The limited benefits in the physical layer come from CNS rationalisation for legacy issues and of doing so at a pan-European level. Increased benefits when considering deployment of new technology.	€ 1,620 m (3% reduction)

How to regulate?

The current legislation supports either economic regulation or competition (for non-delegated services). The current form of economic regulation does not appear to incentivise the correct behaviours (service delivery/modernisation) and returns are based on capital employed.

Regulation

Price Setting/Capping coupled to service level guarantees/targets to regulate the market.

Intent is to deliver the same value for money as competition. The benefits may be limited if benchmarking can't identify the optimal level of efficiency.

The form regulation needs to balance risk (including consideration of CAPEX/OPEX balance, scalability etc).

Collaboration

If ANSPs can effectively collaborate to deliver value for money should they be subject to a "lighter" form of collaboration that incentivises risk sharing within the collaboration?

Competition

Competition in a contestable market:

- Low barriers to entry
- Limited sunk costs allowing new entities to exit the industry

Incentivises greater performance as entities strive to sustain and grow market power/share, resulting in a more cost- efficient and better-quality service.

May result in duplication of infrastructure to support competition?

OUR EXPERTISE

Thank you for listening

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