Security by design

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SESAR JOINT UNDERTAKING

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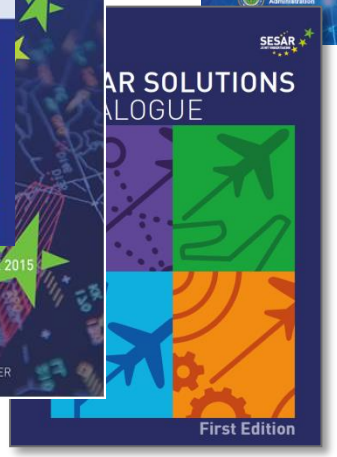
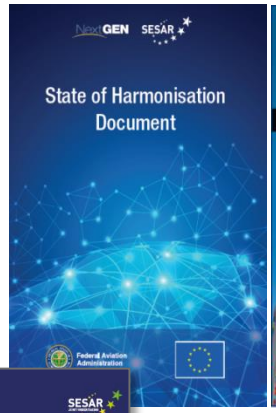
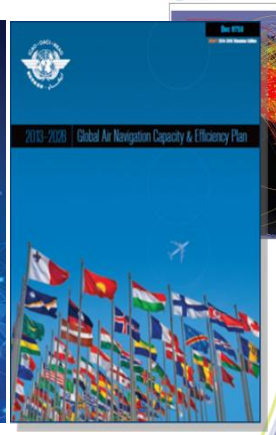
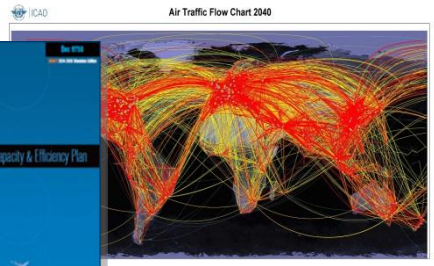
SESAR vision









SECURITY

- Ensuring high levels of security

COST EFFICIENCY

- Up to **40%** reduction in air navigation services costs per flight

CAPACITY

- Up to **30%** reduction in departure delays
- Up to **10%** additional flights landing at congested airports
- A system capable of handling up to **100%** more traffic

ENVIRONMENT

- Up to **10%** reduction in CO_2 emissions
- Positive impact on noise and air quality

OPERATIONAL EFFICIENCY

- Up to **6%** reduction in flight time
- Up to **10%** reduction in fuel burn

SAFETY

- Improvement by up to a factor of **4**

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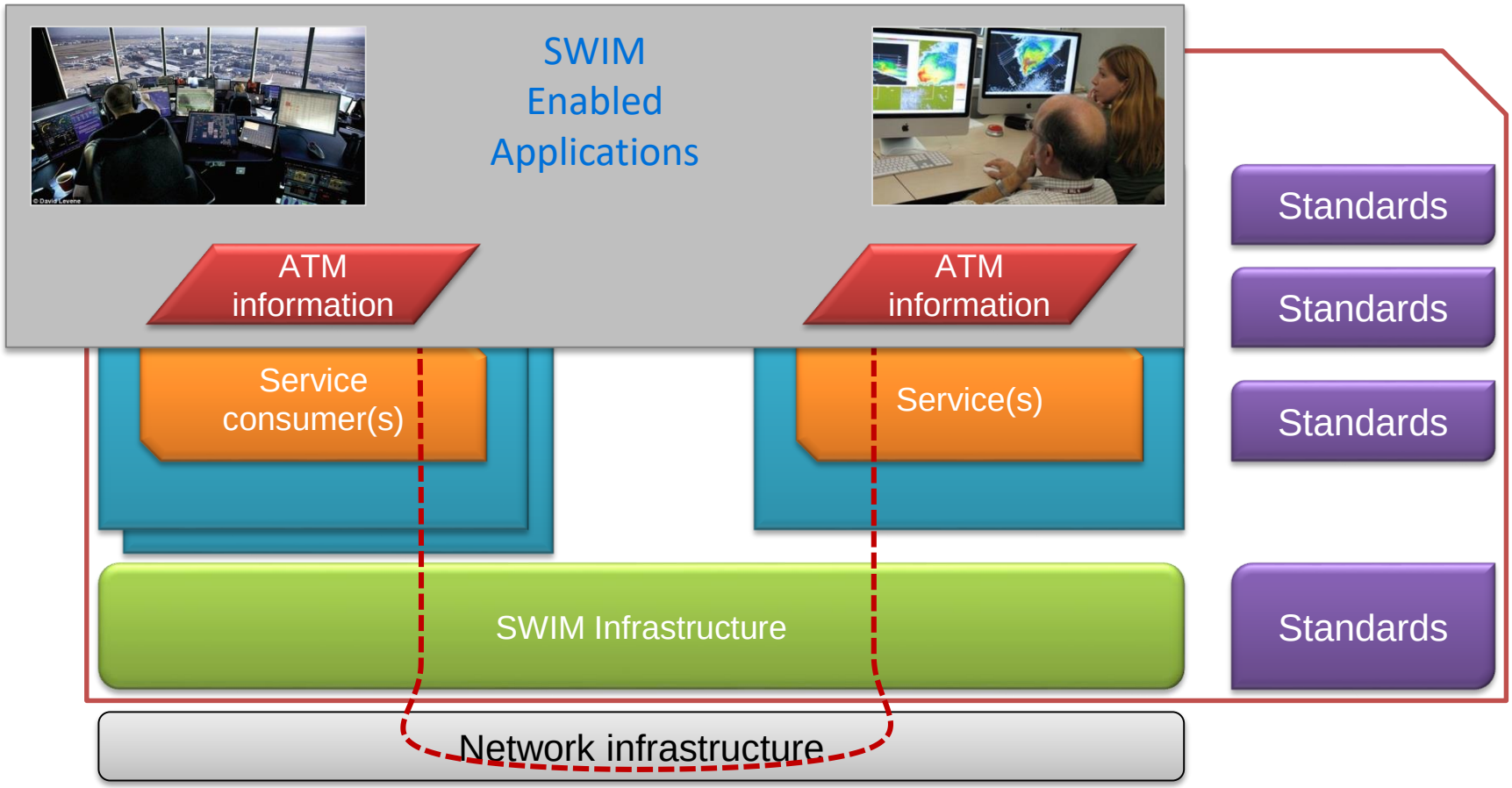
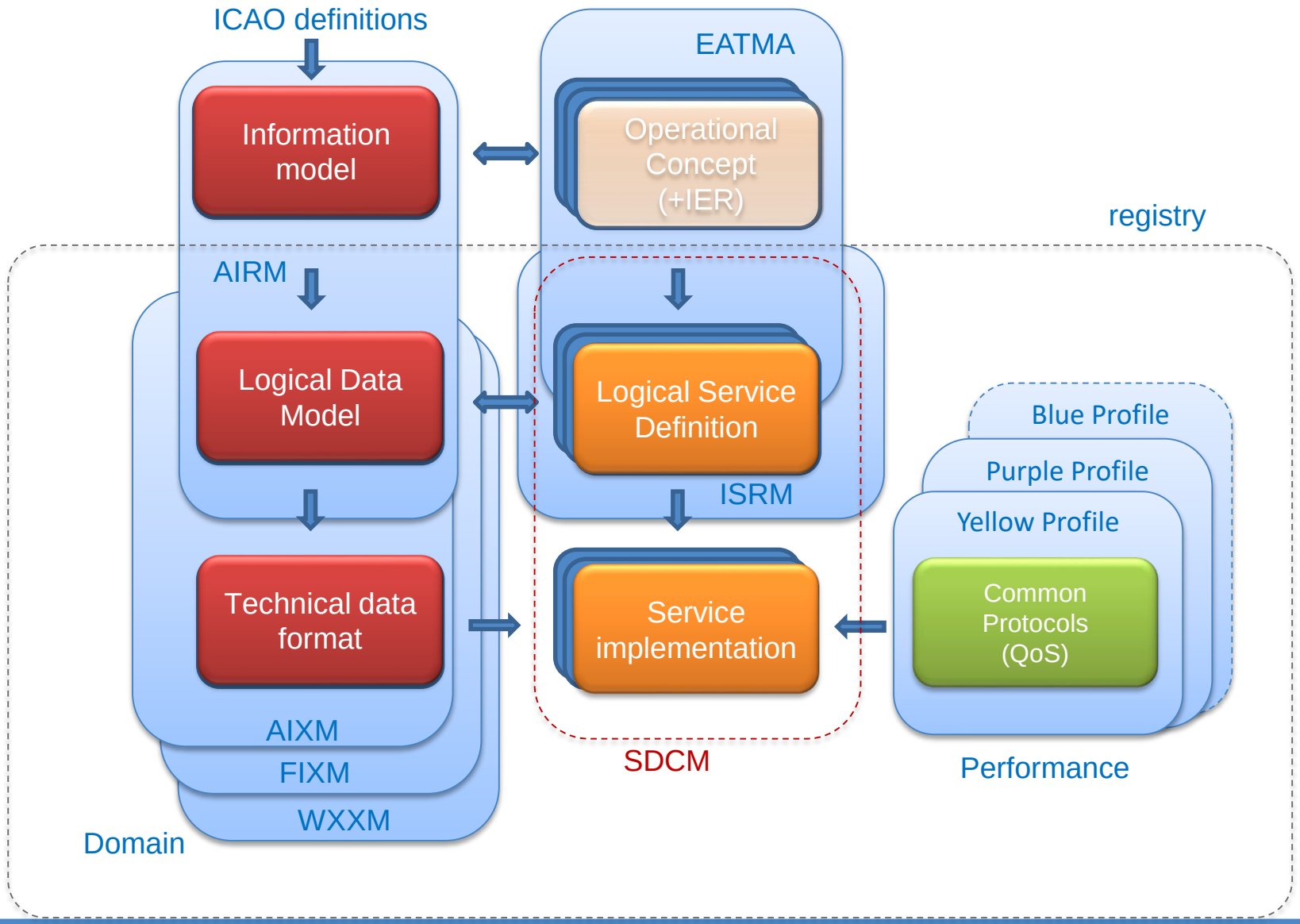
SWIM definition

SWIM is not (just) a set of services, but rather the future way of service development

SWIM consists of standards, infrastructure and governance enabling the management of ATM information and its exchange between qualified parties via interoperable services.



What's underneath?



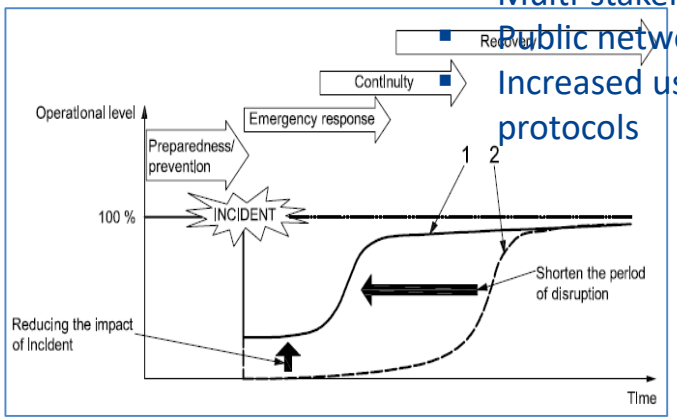
The securability of SESAR solutions

ATM needs	Scope	Feasibility	Pre-industrial development & integration	Industrialization	Deployment	Operations	Decommissioning
V0	V1	V2	V3	V4	V5	V6	V7

Cyber resilient architecture

High level requirements for industrialization, deployment and operations

- New challenges
  - Multi-stakeholder system of systems
  - Public networks
  - Increased use of COTS and standard protocols



Aspects of cyber-resilience

Foresight - prediction, anticipation

Robustness - ability to keep operating

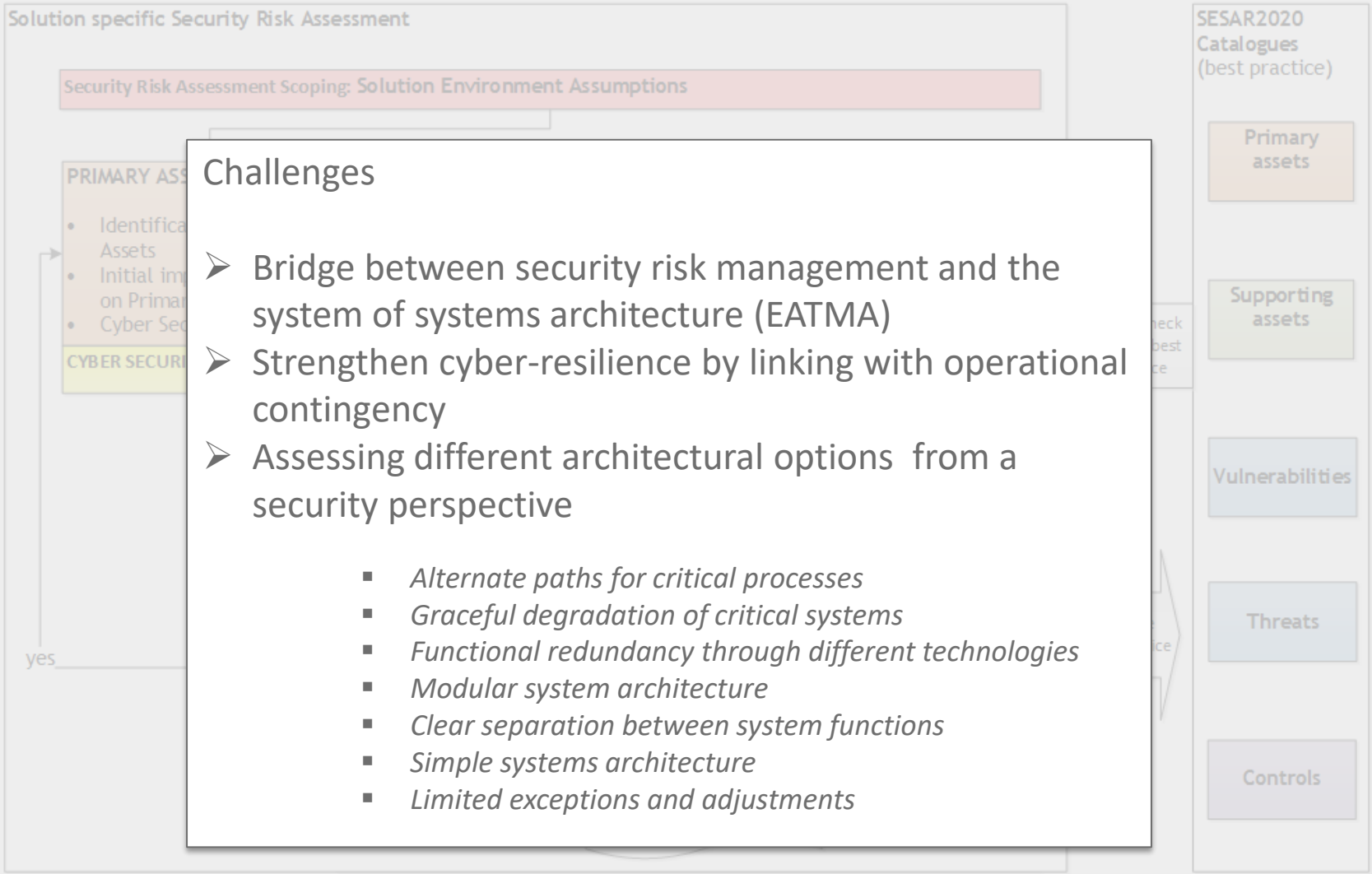
Resourcefulness - control damage, mitigate it

Redundancy - substitutable

Rapid recovery

Adaptability - to changing environments

SESAR's Security Risk Assessment



Challenges

- Bridge between security risk management and the system of systems architecture (EATMA)
- Strengthen cyber-resilience by linking with operational contingency
- Assessing different architectural options from a security perspective
    - *Alternate paths for critical processes*
    - *Graceful degradation of critical systems*
    - *Functional redundancy through different technologies*
    - *Modular system architecture*
    - *Clear separation between system functions*
    - *Simple systems architecture*
    - *Limited exceptions and adjustments*

Conclusions

- SWIM and increased connectivity of a wider set of stakeholders increases the need to take a system-of-systems approach to security
- The SESAR cybersecurity strategy and framework study provides a European framework, enabling the application of an Aviation Security Maturity Model to define the roadmap towards fully secured aviation
- The SESAR programme develops, validates and delivers ***securable*** solutions, by applying the SESAR security risk assessment methodology
- Research is ongoing within SESAR to strengthen the translation of operational cyber resilience requirements into tangible security controls
- There is a need for a European trust framework to share security material on a need to know basis

Cyber security taskforce, OTSC03

Thank you very much for your attention!

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