



ENGAGE cyber workshop

Setting the scene

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Founding Members



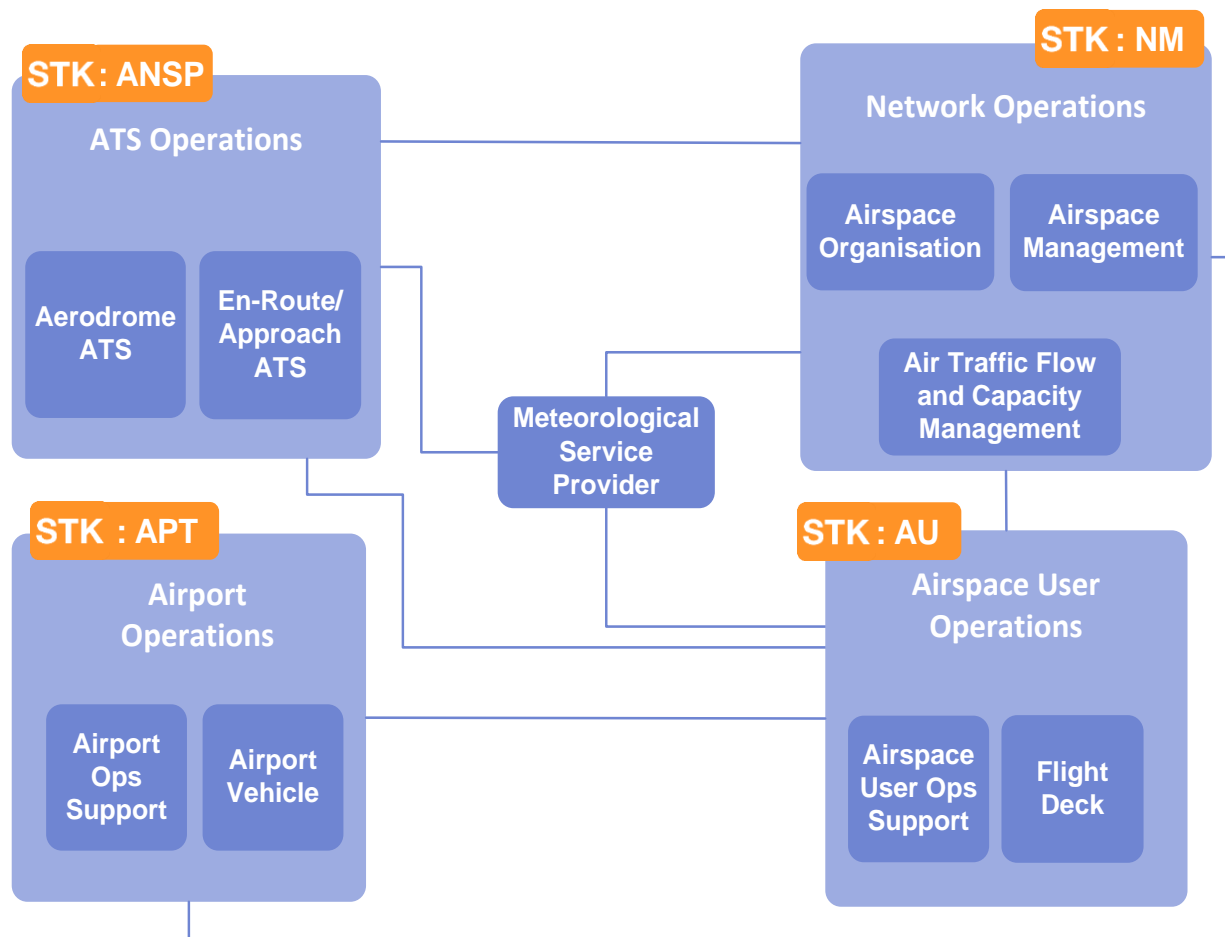
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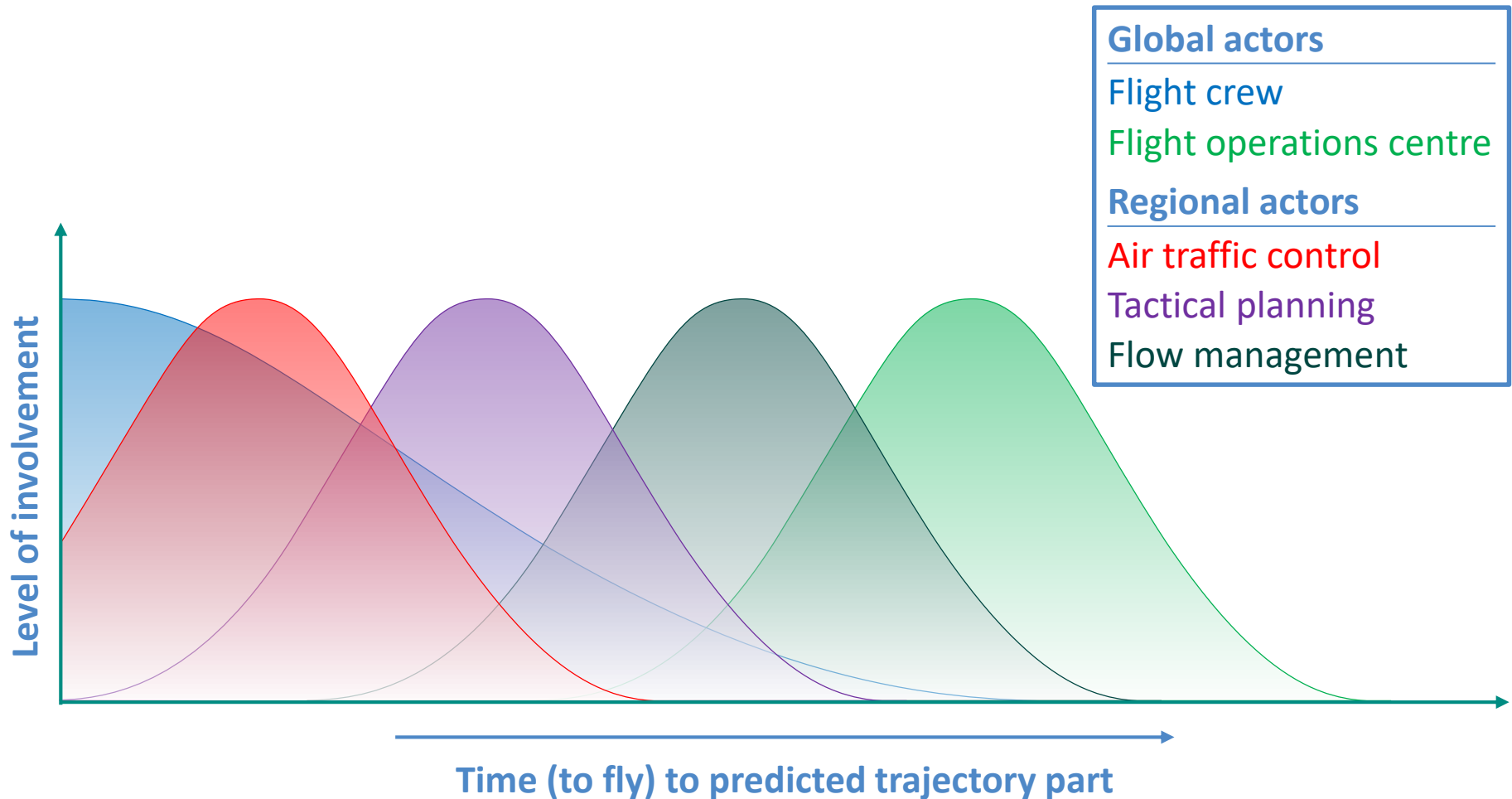
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Specifics of cyber security in ATM

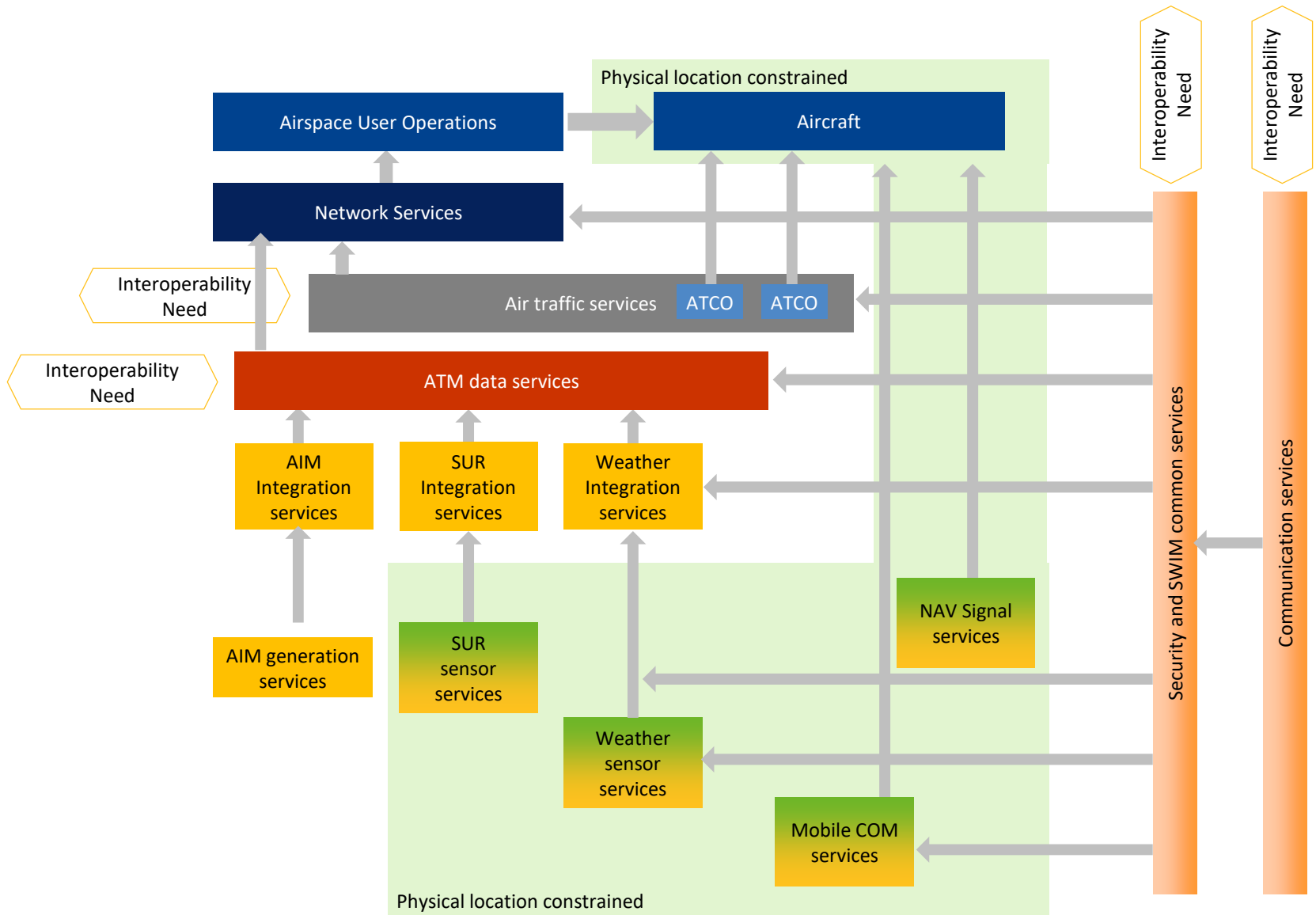
Multiple stakeholders, System of systems



Varying safety and time criticality



A system has many components

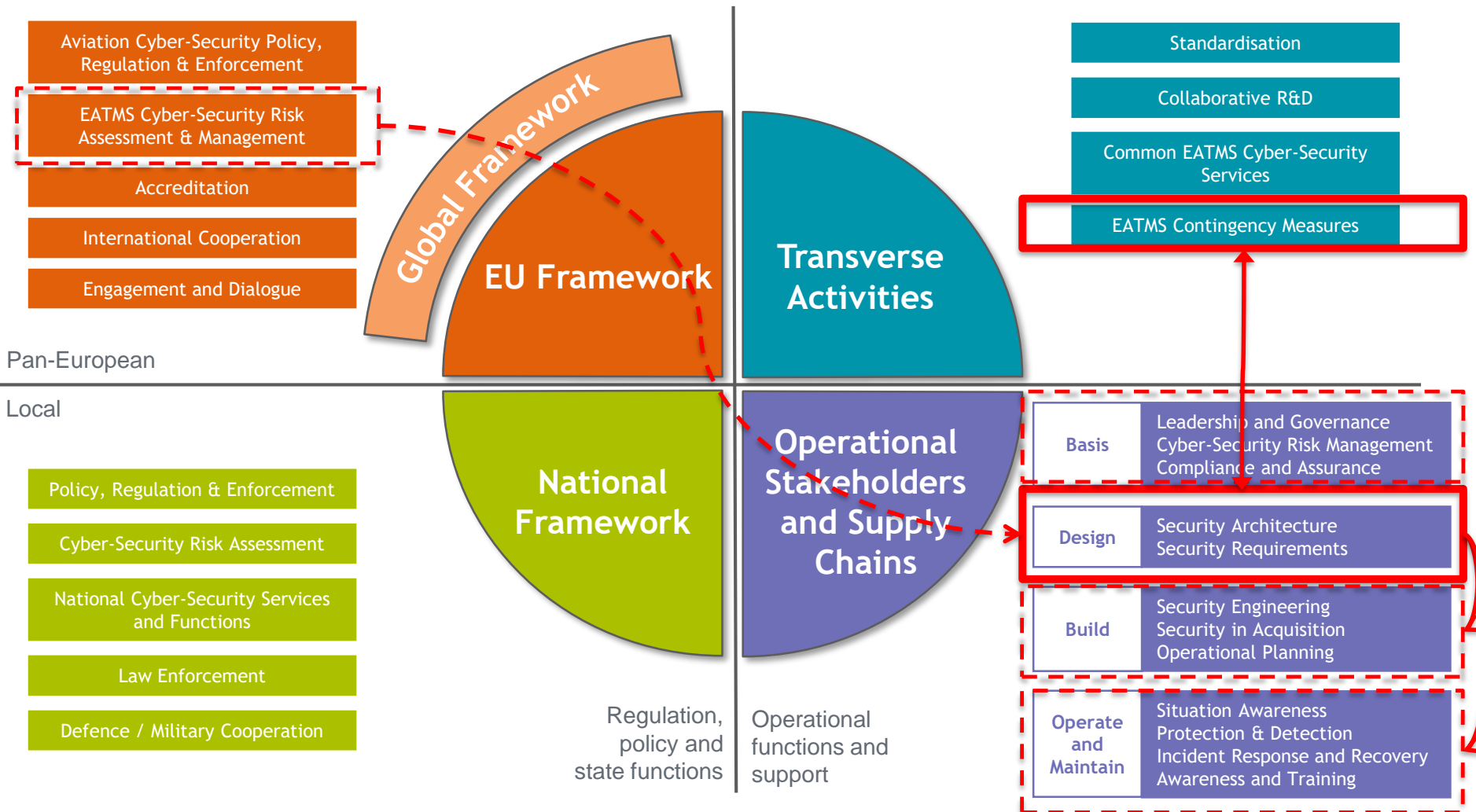


Increasing levels of automation

			Definition of Level of Automation per Task					Automation Level Targets per MP phase (A, B-C, D)	
Definition			Information Acquisition and Exchange	Information Analysis	Decision and Action Selection	Action Implementation	Autonomy	Air Traffic Control	U-space services
Actions can only be initiated by Human	Level 0 Low Automation	Automation supports the human operator in information acquisition and exchange and information analysis						A	
	Level 1 Decision Support	Automation supports the human operator in information acquisition and exchange, information analysis and action selection for some tasks/functions						B/C	
	Level 2 Task Execution Support	Automation supports the human operator in information acquisition and exchange, information analysis, action selection and action implementation for some tasks/functions. Actions are always initiated by Human Operator. Adaptable/adaptive automation concepts support optimal socio-technical system performance.						D	
Action can be initiated by Automation	Level 3 Conditional Automation	Automation supports the human operator in information acquisition and exchange, information analysis, action selection and action implementation for most tasks/functions. Automation can initiate actions for some tasks. Adaptable/adaptive automation concepts support optimal socio-technical system performance.							B/C
	Level 4 High Automation	Automation supports the human operator in information acquisition and exchange, information analysis, action selection and action implementation for all tasks/functions. Automation can initiate action for most tasks. Adaptable/adaptive automation concepts support optimal socio-technical system performance.							D
	Level 5 Full Automation	Automation performs all tasks/functions in all conditions. There is no human operator.							

What's going on in SESAR on cyber?

The wider perspective

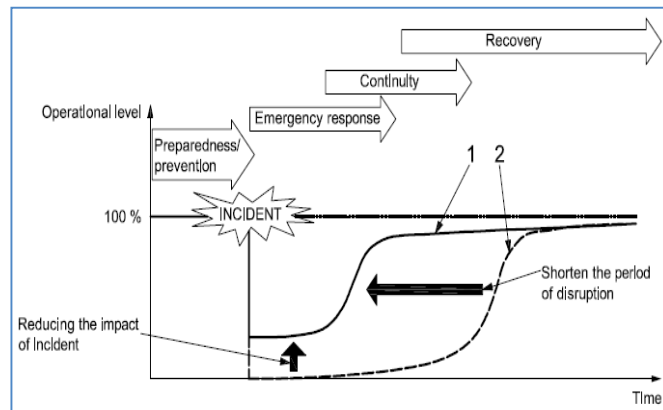


Cyber resilience



Cyber resilient architecture

High level requirements for industrialization, deployment and operations

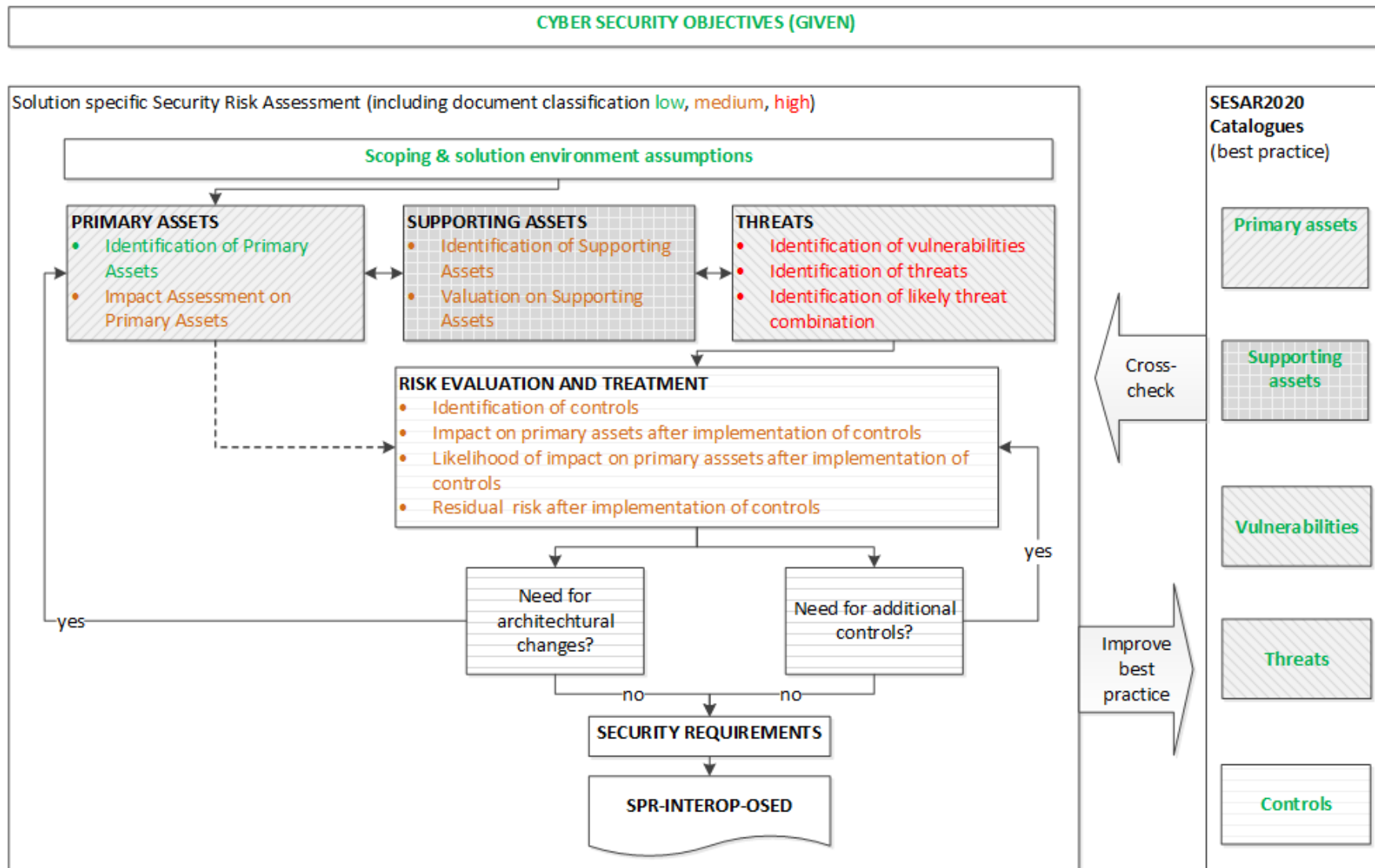


Aspects of cyber-resilience

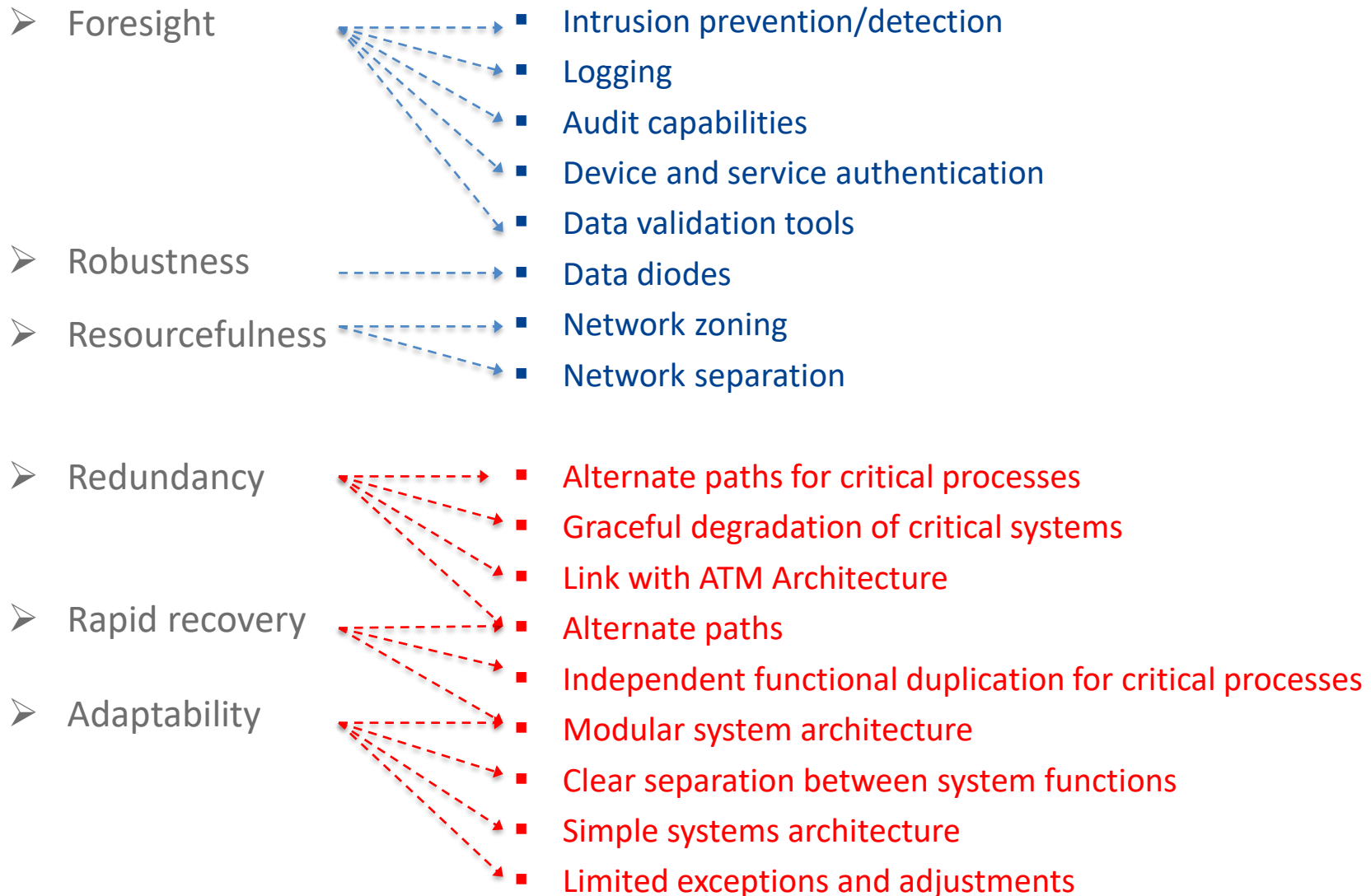
- Foresight - prediction, anticipation
- Robustness - ability to keep operating
- Resourcefulness - control damage, mitigate it
- Redundancy - substitutable
- Rapid recovery
- Adaptability - to changing environments

*Resilience is the ability to **prevent** disruptions, to **prepare** for and adapt to changing conditions and to **respond** and **recover** rapidly from disruptions to ensure the continuity of **services** at an acceptable performance level.*

Methodology for Industrial Research

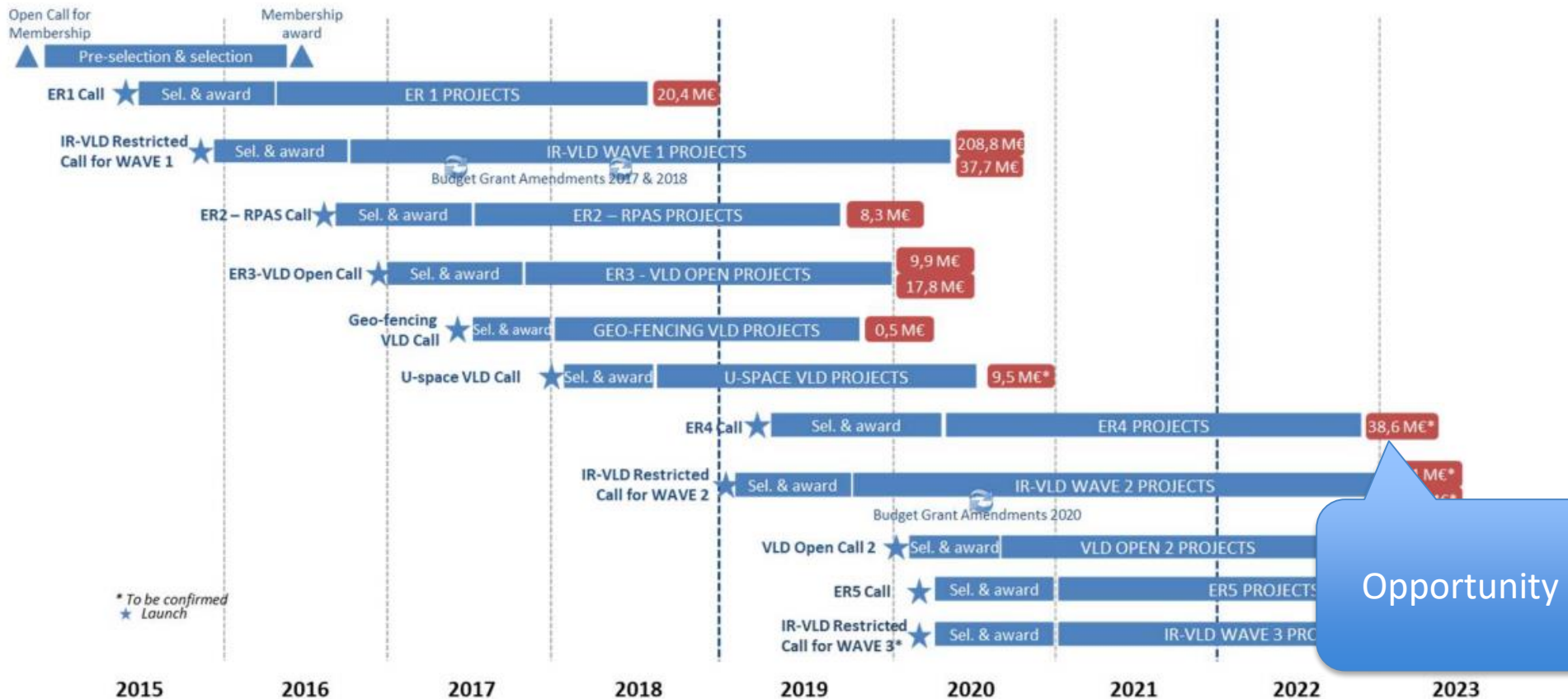


Cyber controls



What's next?

SESAR calls for research



New cyber security technologies

- New encryption methodologies
- Block chain
- Secure data cloud
- Network surveillance
- User behaviour analytics
- AI in surveillance and analytics
- Trust framework solutions

Some questions

- What is more secure: old and obscure technologies or modern and open technologies?
- Should CNS be encrypted and how to secure existing non-encrypted CNS ?
- Technology is evolving faster & faster – how to ensure that our design is “future proof”?
- Avoiding tailor made approaches for aviation and opening up to new ideas from other critical infrastructures such as banking
- Is security so different from safety? Can we aim at a Safety and Security Management System?
- How to establish trust in a global environment?

Expectations for this workshop



Prepare for future research proposals!

This is the knowledge transfer network....

- Understand who knows what
- Understand what is already available
- Understand what has already been researched

What would be relevant future research?



ENGAGE cyber workshop – setting the scene

Thank you very much
for your attention!



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