EUROPEAN UNION AGENCY
FOR CYBERSECURITY

CYBERSECURITY CHALLENGES IN SATELLITE SYSTEMS

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EUROPEAN
UNION AGENCY
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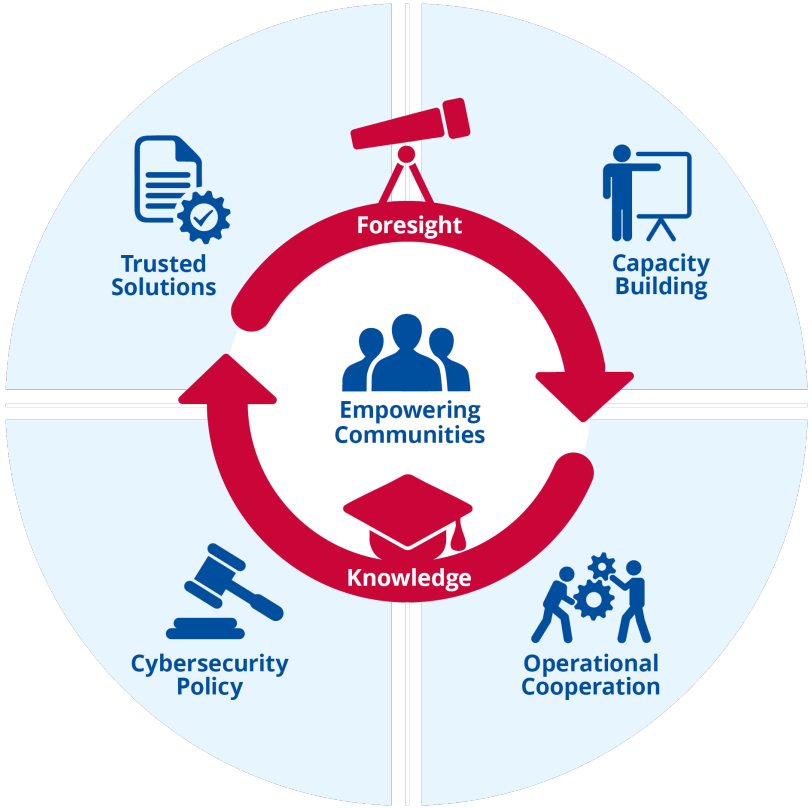
20 years!

Our mission is to achieve a ***high common level of cybersecurity across the Union***

enisa EUROPEAN UNION AGENCY FOR CYBERSECURITY 20 years!



AREAS OF WORK

Cloud and Big Data

COVID19

Critical Infrastructures and Services

CSIRT Services

CSIRTs and communities

CSIRTs in Europe

Cyber Crisis Management

Cyber Exercises

Cybersecurity Education

Data Protection

National Cybersecurity Strategies

NIS Directive

Standards and Certification

Threat and Risk Management

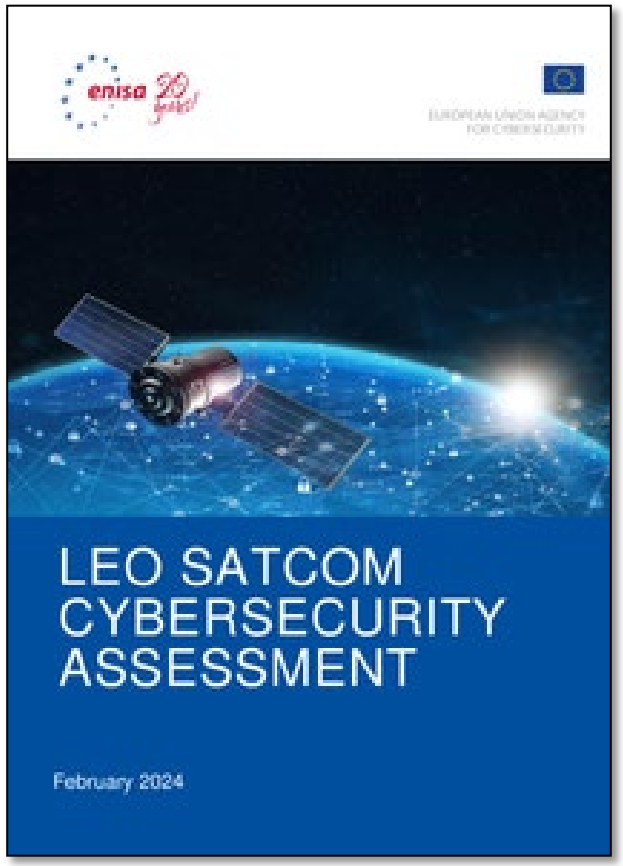
Cyber Crisis Management

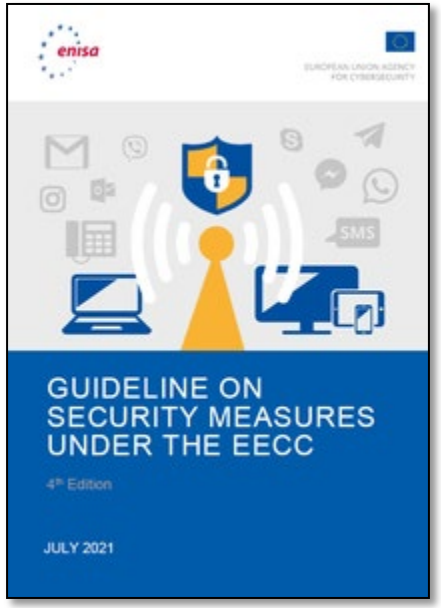
IoT and Smart Infrastructures

Trust Services

Trainings for Cybersecurity Specialists

ENISA GUIDANCE FOR SATELLITES





POLICY CONTEXT

SPACE CYBERSECURITY EU POLICIES

EECC Directive

- Commercial satellite operations are part of the telecommunication sector
- Appropriate and proportionate **technical and organizational measures to manage the risks posed to the security** of public electronic communications networks and services

NIS2 Directive

- Space (operators of ground-based infrastructure) is included as one of the critical sectors
- Appropriate and proportionate technical, operational and organizational measures to manage the risks posed to the security of network and information systems which essential and important entities use for their operations or for the provision of their services

EU Space Strategy for Security and Defence

- Creation of an annual classified space threat landscape
- Establishment of an EU Space ISAC
- Proposal for an EU Space Law to cover the part of the space sector, which is not in scope of NIS2

NIS2 CYBERSECURITY REQUIREMENTS

- Policies on risk analysis and information system security
- Incident handling
- Business continuity (backup and crisis management, disaster recovery)
- Supply chain security
- Security in network and IS acquisition, development and maintenance
- Policies and procedures on effectiveness of risk-management measures
- Basic cyber hygiene practices and cybersecurity training
- Policies and procedures regarding the use of cryptography and encryption
- Human resources security, access control policies and asset management
- Use of multi-factor authentication or continuous authentication solutions

The European Commission and EUSPA are spearheading the formation of the **EU Space Information Sharing Centre (ISAC)**

This network-based information-sharing platform promotes collaboration, awareness and best practices among private entities to ensure the safety of our space systems and the networks they rely on.

Who Can Join?

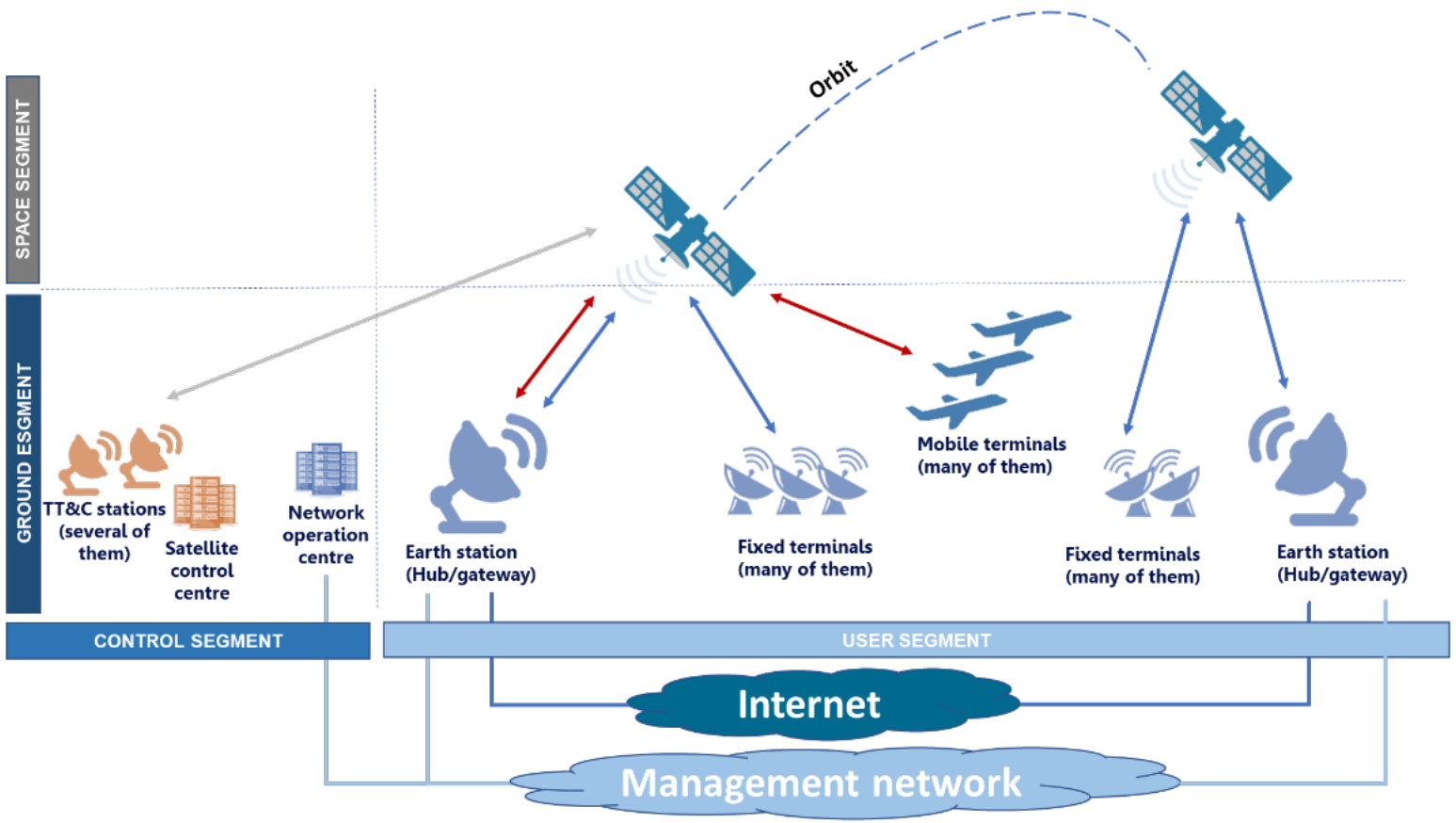
- **Founding Participants:** those dedicated to shaping the governance of EU Space ISAC. They play a pivotal role in its inception, driving its initial activities and promoting wider participation.
- **Members:** private entities from the EU Space sector, EU academic institutions, and other recognized institutions contributing space sector security knowledge.
- **Public Partners:** entities like EU institutions, bodies and agencies, European Space Agency, national space agencies, and National Computer Emergency Response Teams.

THREATS, RISKS, CHALLENGES

USES OF SATELLITE SYSTEMS

Application	Example of implementation	Economy Sectors
IoT	Location tracking of a containers and alerting in case of an anomaly (e.g. door opening)	Transport / Rail
Network interconnection	Backup trans-national network for the monitoring of European power grids	Energy / Electricity
Telephony	Satellite-enabled telephony for assessment teams during a disaster with potential destruction / saturation of the terrestrial cell phone networks	Public administration
M2M	Monitoring and remote operation of hydroelectric plants in remote areas	Energy / Electricity
Internet access	Backup of terrestrial-based Internet access for the logistics department of a hospital	Health / Healthcare providers

ARCHITECTURE



LIFECYCLE

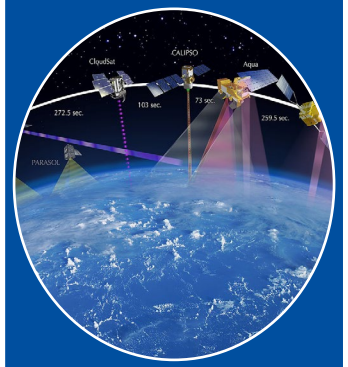
Design and development

Assembly

Prelaunch

Launch

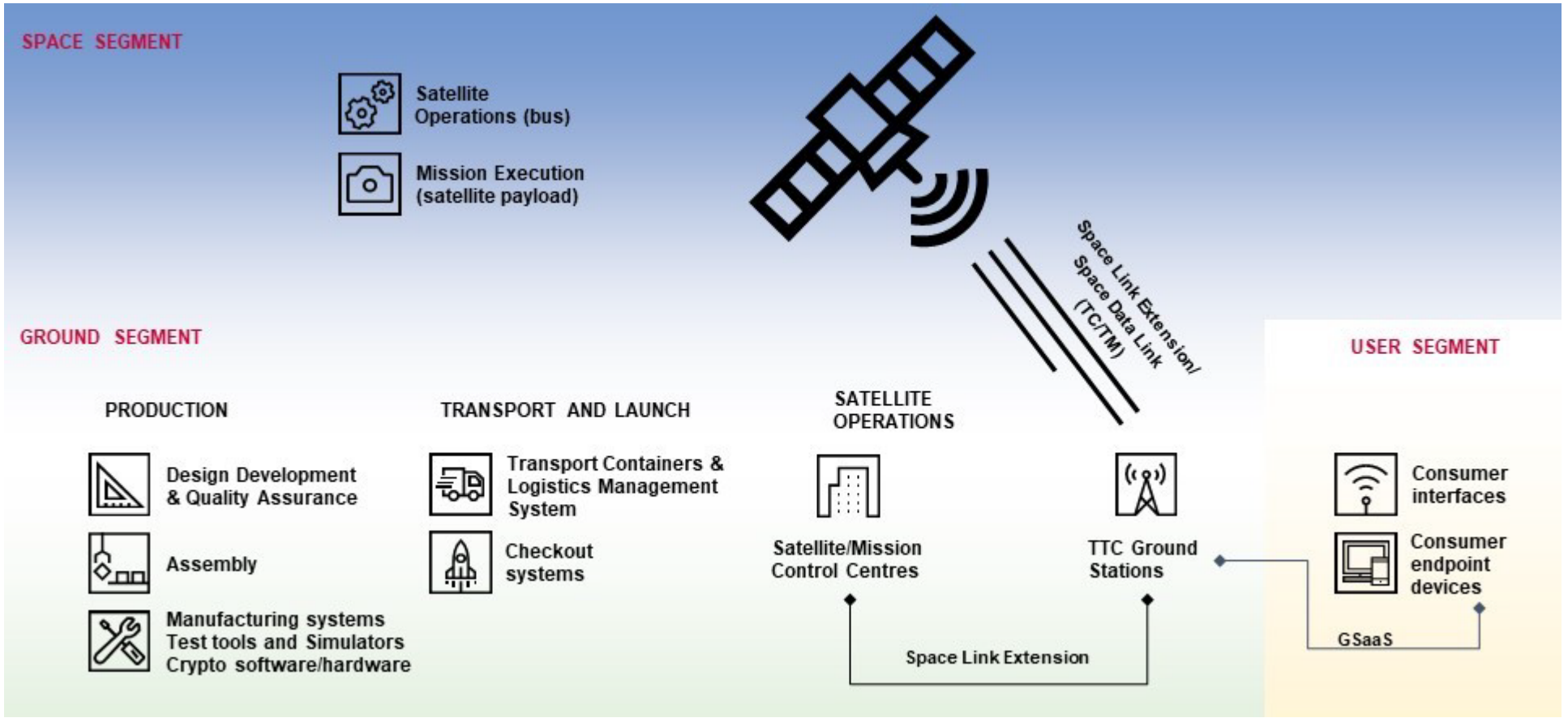
On orbit check



Operations

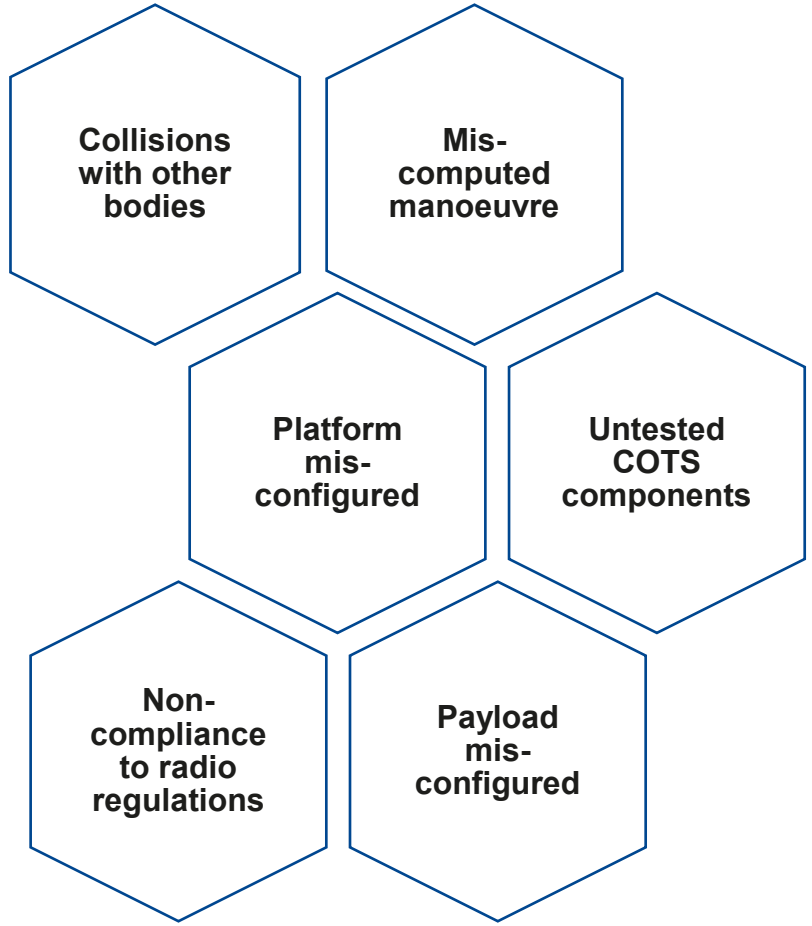
Decommissioning

ASSETS

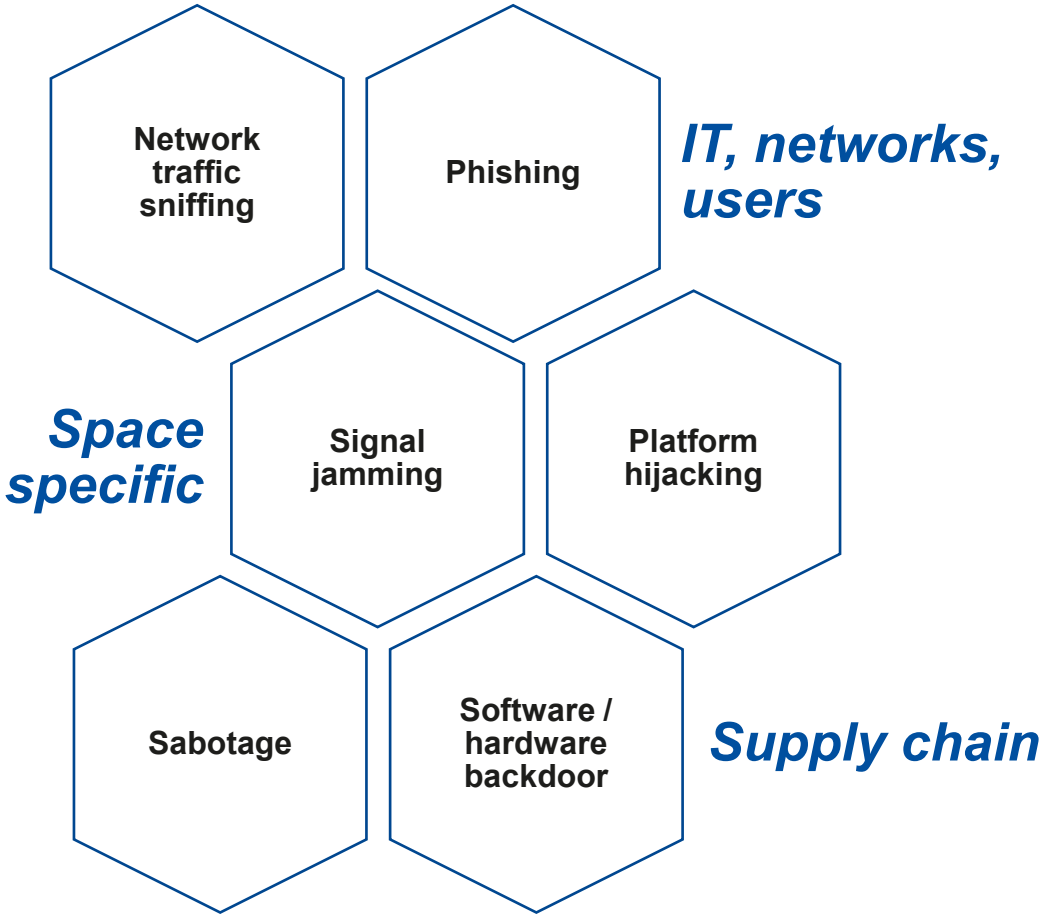

SPACE SEGMENT
Satellite Operations (bus)
Mission Execution (satellite payload)
Space Link Extension/ Space Data Link (TC/TM)
GROUND SEGMENT
USER SEGMENT
PRODUCTION
TRANSPORT AND LAUNCH
SATELLITE OPERATIONS
Design Development & Quality Assurance
Assembly
Manufacturing systems Test tools and Simulators Crypto software/hardware
Transport Containers & Logistics Management System
Checkout systems
Satellite/Mission Control Centres
TTC Ground Stations
Consumer interfaces
Consumer endpoint devices
GSaaS
Space Link Extension

THREATS

Non malicious



Malicious



ASSOCIATED RISKS

Technical

- Degradation/outage of commercial services
- Hijacking of communication capabilities
- Information theft, forgery
- Damage or destruction of assets

Commercial

- Harm to the company reputation
- Loss/degradation of competitive advantage
- Loss of commercial capabilities
- Financial loss because of penalties

CHALLENGES

- **Shift from analogue to digital, use of COTS and complex supply chain** has exposed satellites to a spectrum of cyberthreats (**"standard" terrestrial and space specific**)
- **Coordinated approach in satellite security** (physical and cyber) is difficult to achieve
- Effective protection of satellites requires **risk based approach** and **security measures,** which must be present **in every stage of a satellite lifecycle**
- Despite the fact that some of system elements are **located thousands kilometres away from Earth does not mitigate their exposure to cyber-attacks**
- Cybersecurity in satellites **extends beyond the technical realm, affecting international relations, cooperation, and competition**

THANK YOU FOR YOUR ATTENTION

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