



PEACE OF MIND IN A DANGEROUS WORLD

Digital Resilience: Protecting Spacecraft Computing Platforms



Transformed Space Domain

- Satellite Services are essential part of modern society. ESA Cybersecurity :
“Space is a fundamental pillar of any State in the world in terms of Economy, Security, Sustainability, Energy, Civil Protection and in the daily life of citizens”
- Larger LEO and MEO constellations and ecosystems offer multitenant services
- Satellite Systems (including ground stations) should be considered equally reachable by Cyber criminals and Rogue State actors
- Digital Resilience will be required property of future satellite constellations, services and ecosystems – but what is the metric/quality criteria?

Threats to Space Ecosystem

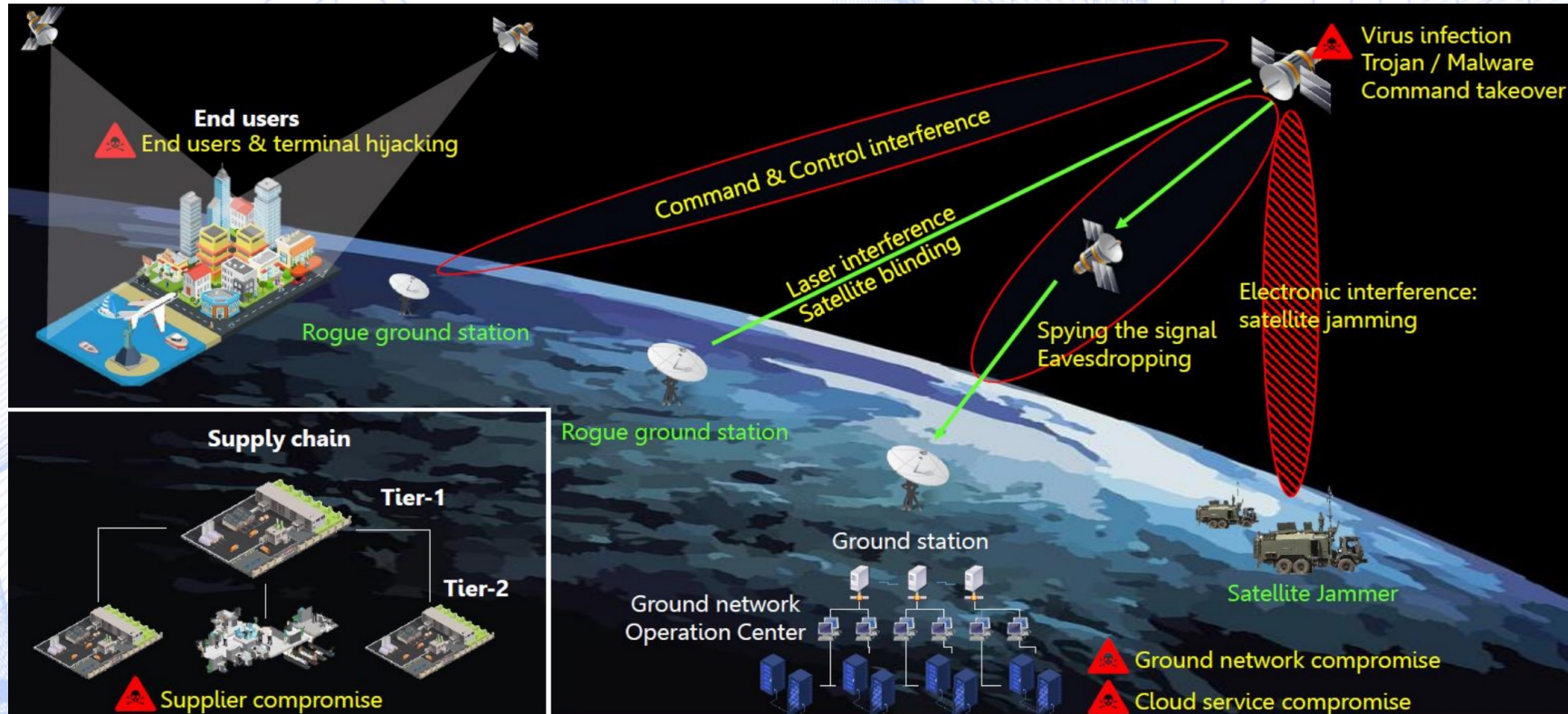
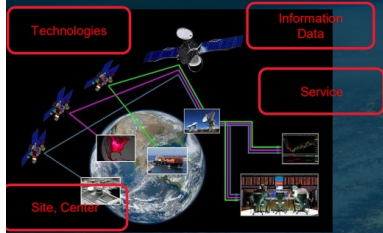


Image-source: ESA GSTP Cybersecurity Compendium Presentation 031122.pdf

Security to Space

THEREFORE.....SECURITY IS IMPORTANT



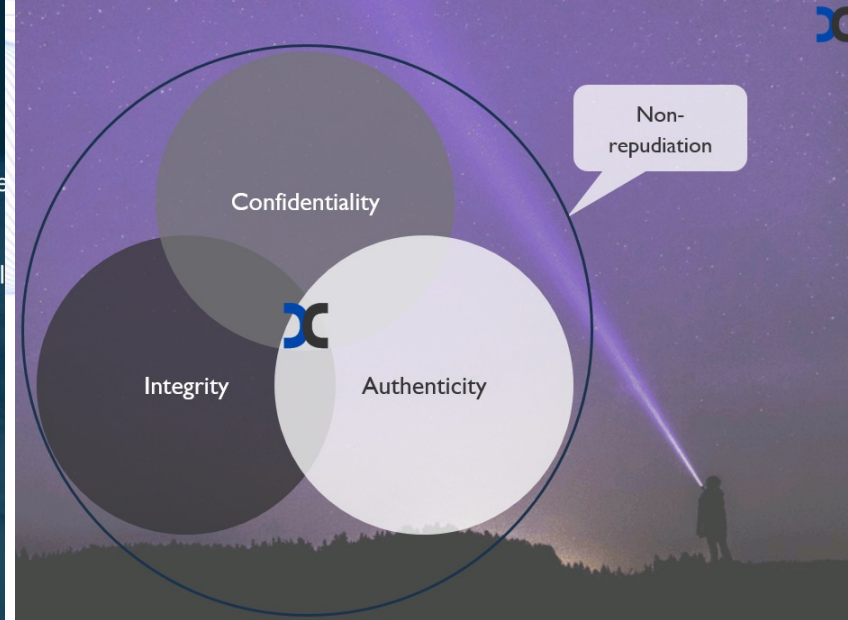
to **protect** any form of confidential, private and sensitive **information** or data or technology from unauthorized access, use, misuse, disclosure, Destruction,modification,or disruption



To Ensure the Confidentiality, the Integrity and the Availability of Space Infrastructure, Systems, Service, Information, Control Centre

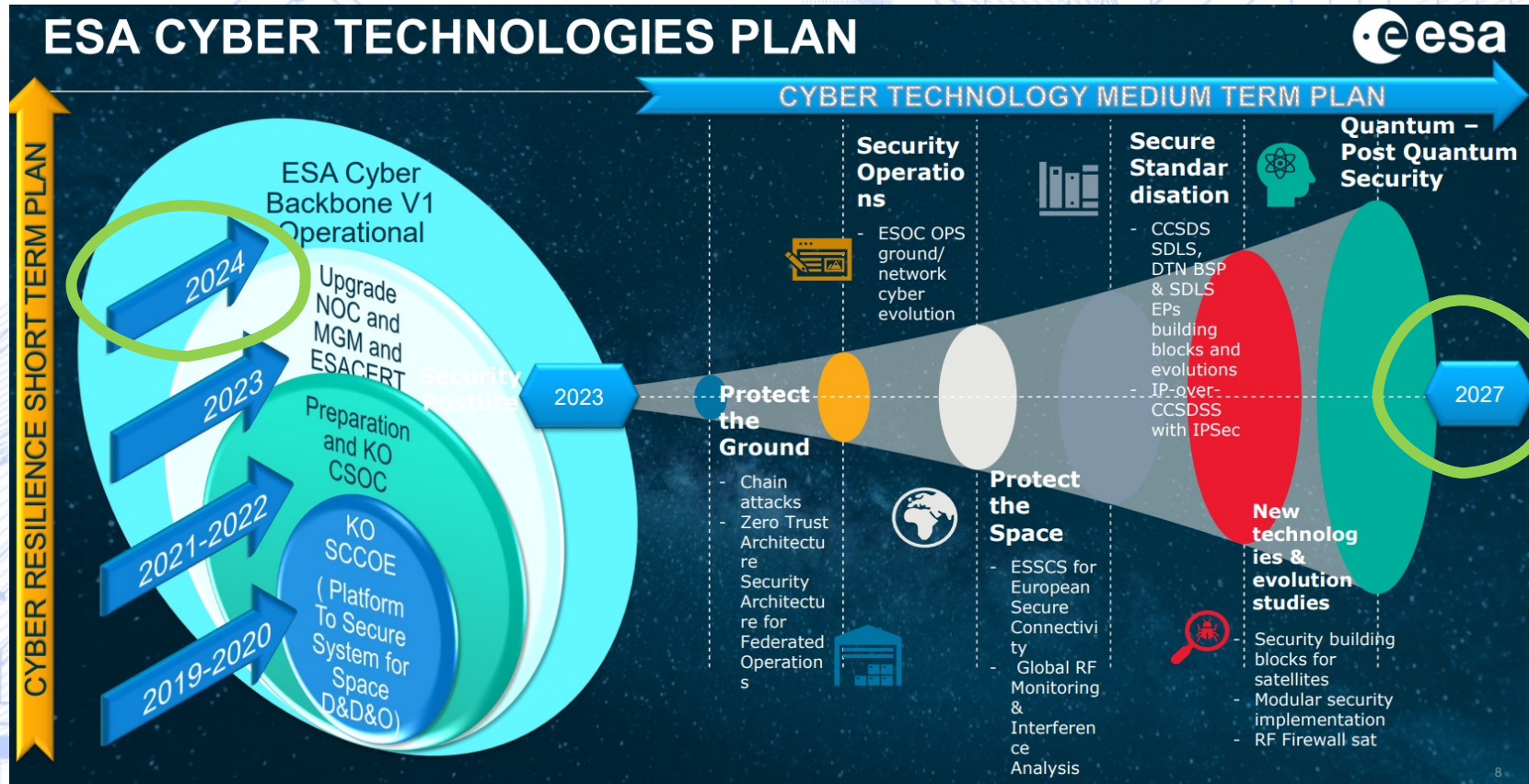
Secure Environment for Secure System

Image-source: ESA GSTP Cybersecurity Compendium Presentation 031122.pdf

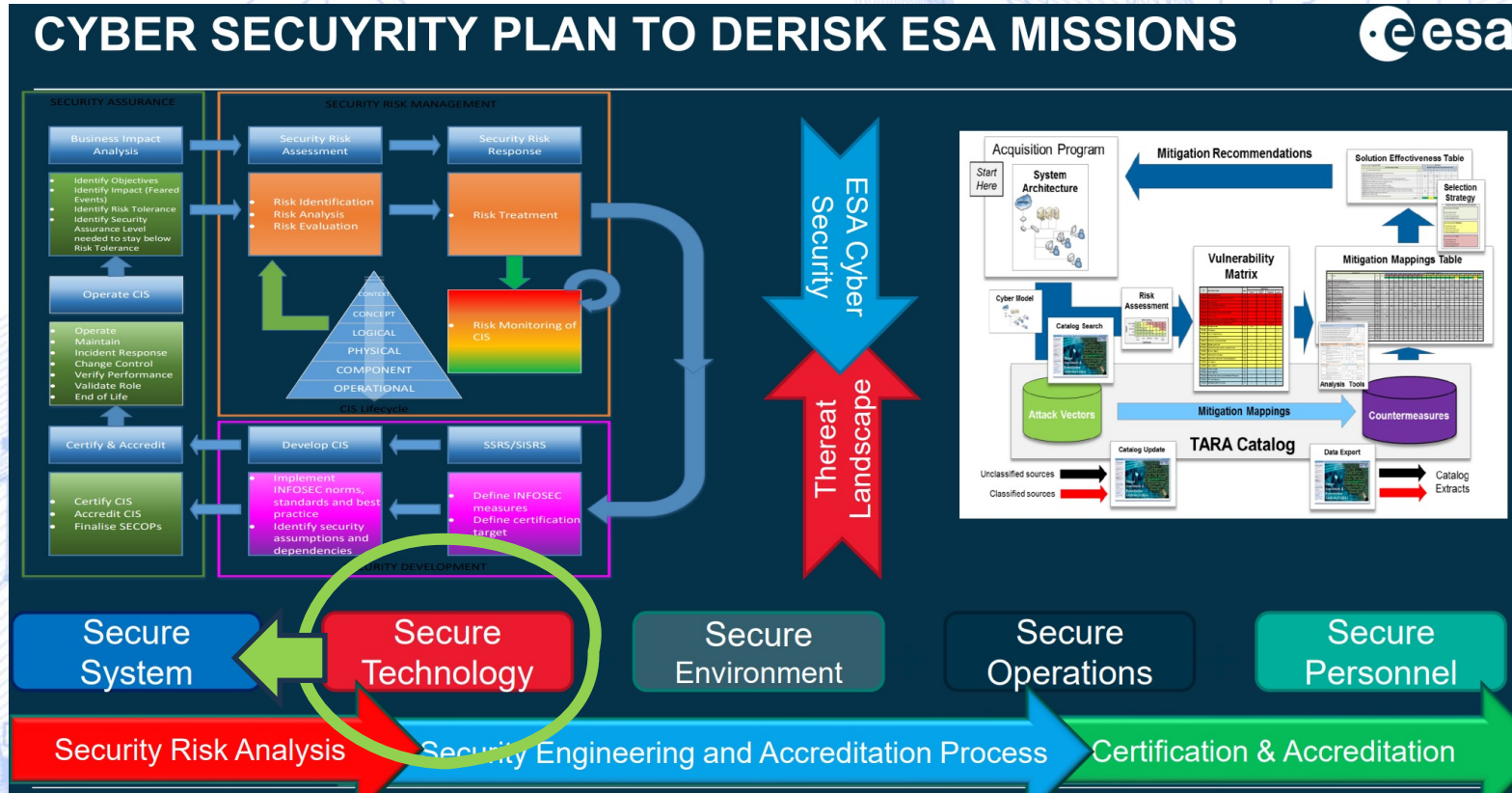


Achievable Security with Cryptography

Cyber Resilience to Space

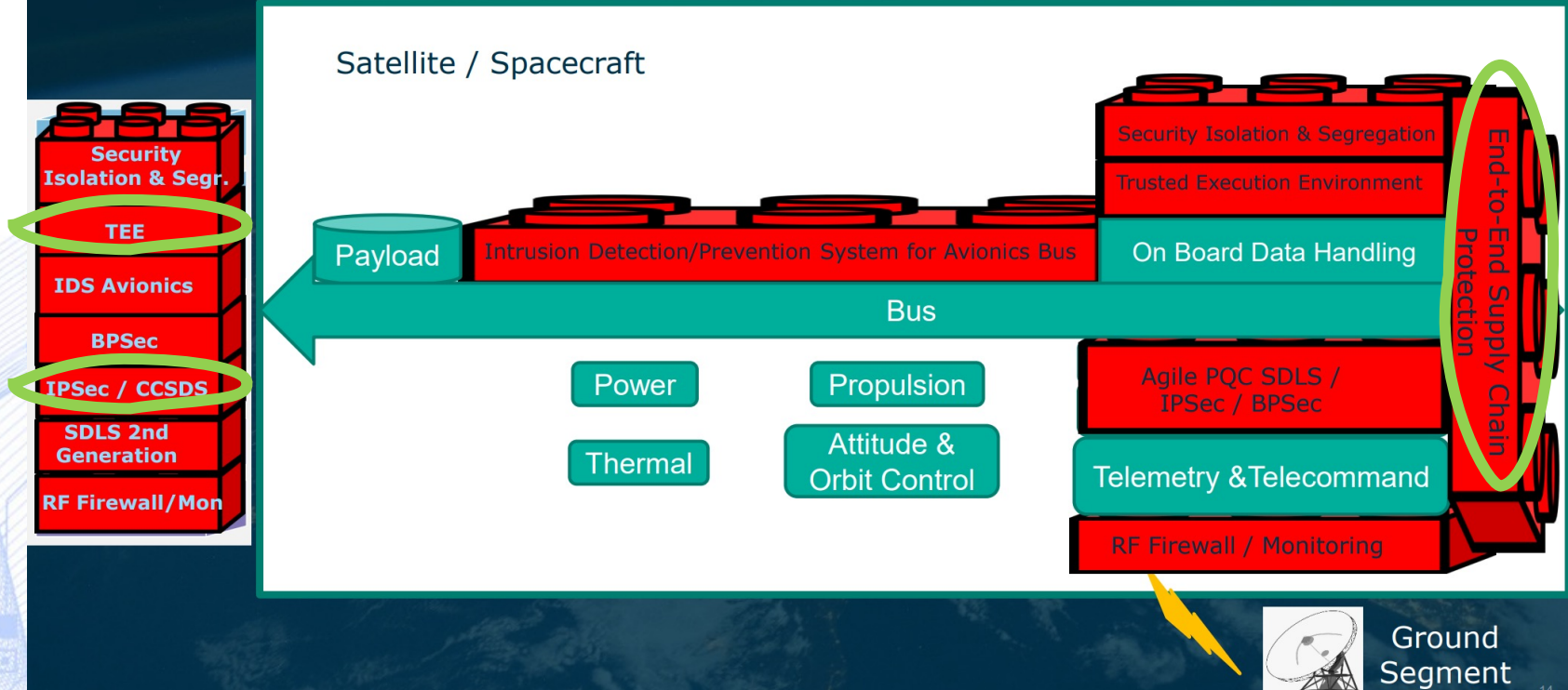


What is needed I

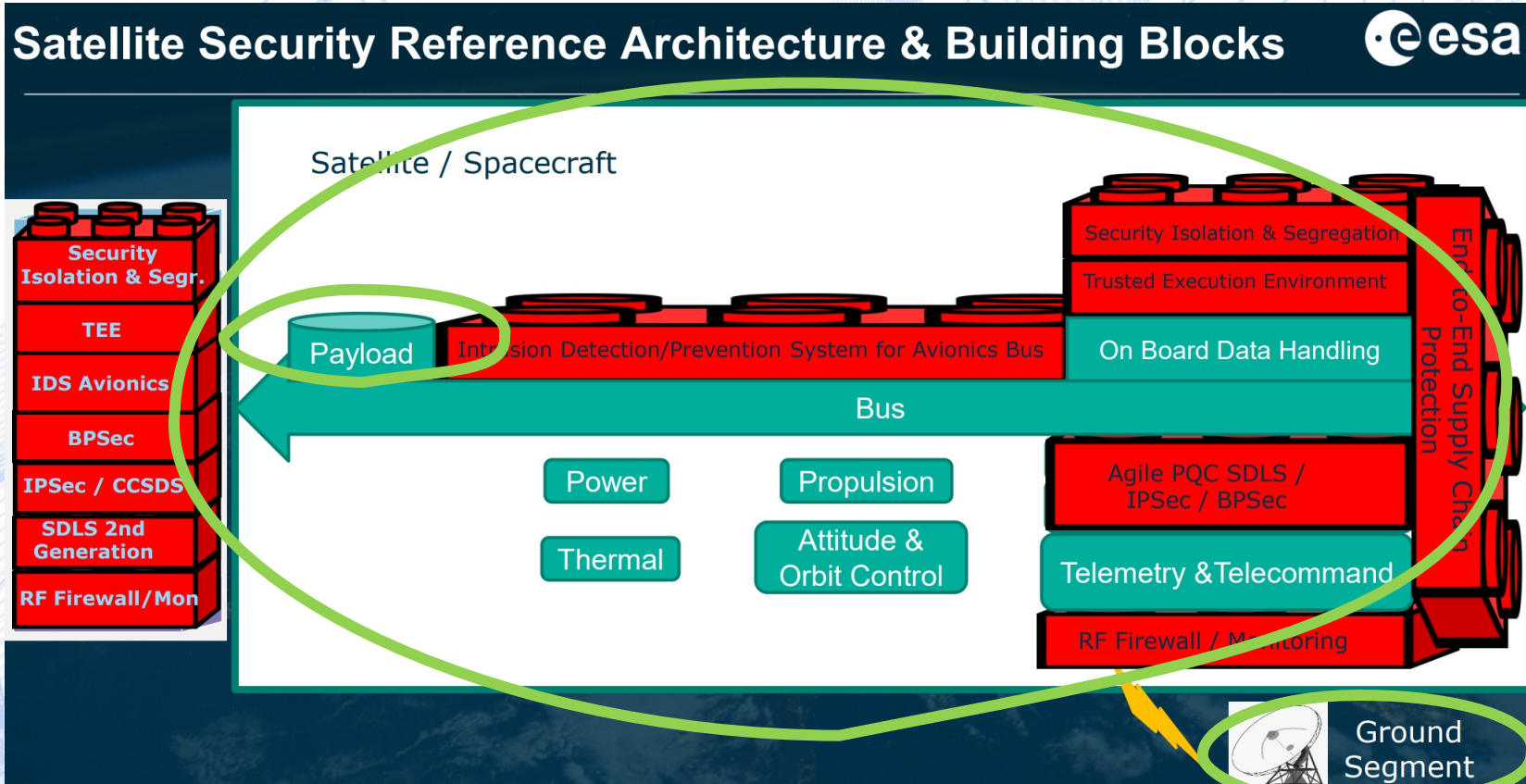


What is needed 2

Satellite Security Reference Architecture & Building Blocks

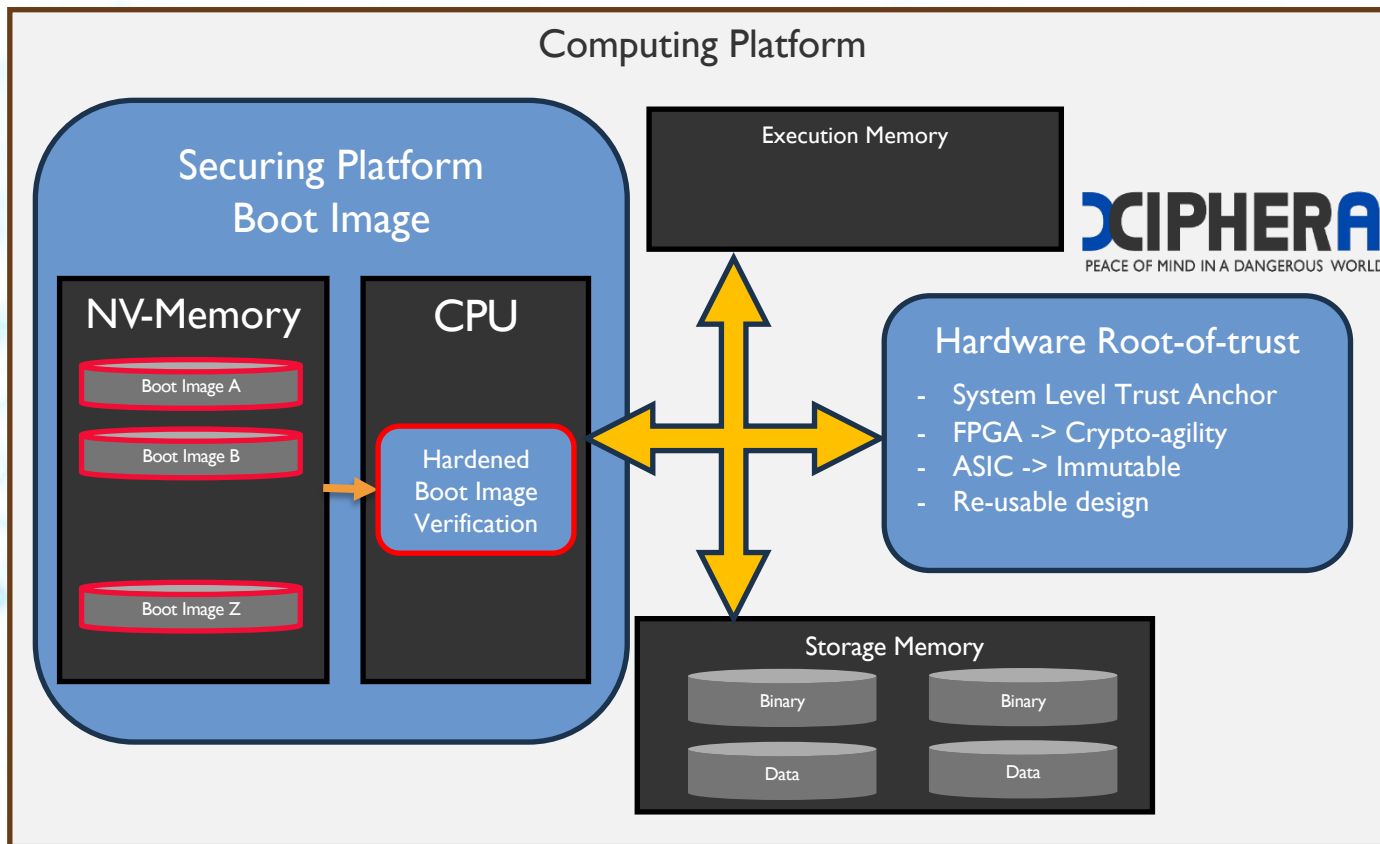


How about Platform and Payload?



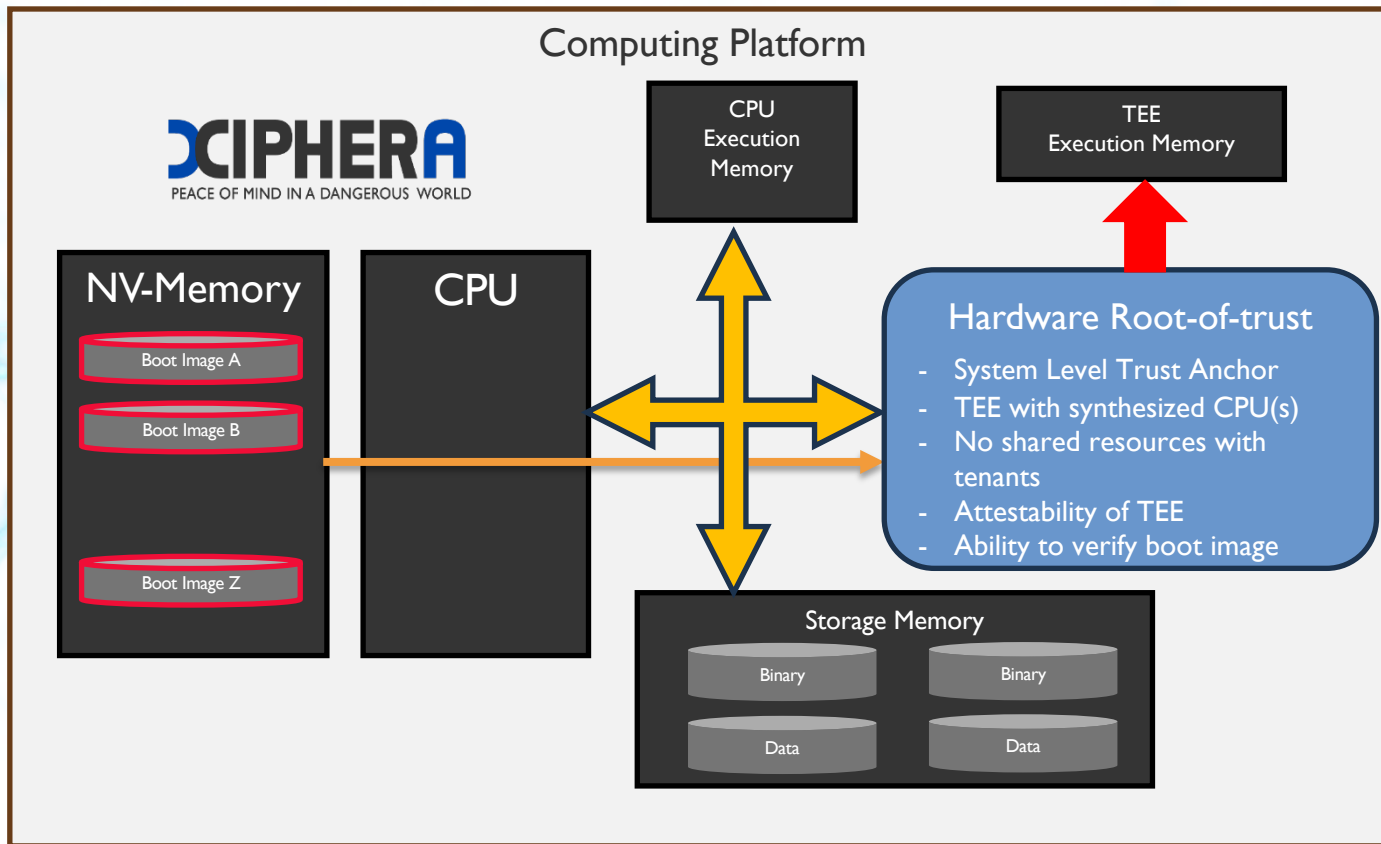
Protecting Spacecraft Computing Platform

- Enables:
- Tamper free OS
 - Cryptography (PQC)



- Enables:
- Payload verification
 - Cryptographic Services
 - Zero Trust Platform

Even More Protection



HW-ROT with TEE enables:

- All HW-ROT functions
- Secure Multitenancy
- Physically isolated code execution
- CPU vulnerabilities can be eliminated
- Host system independent data protection

Securing HW and SW components

Zero trust

Absolute isolation

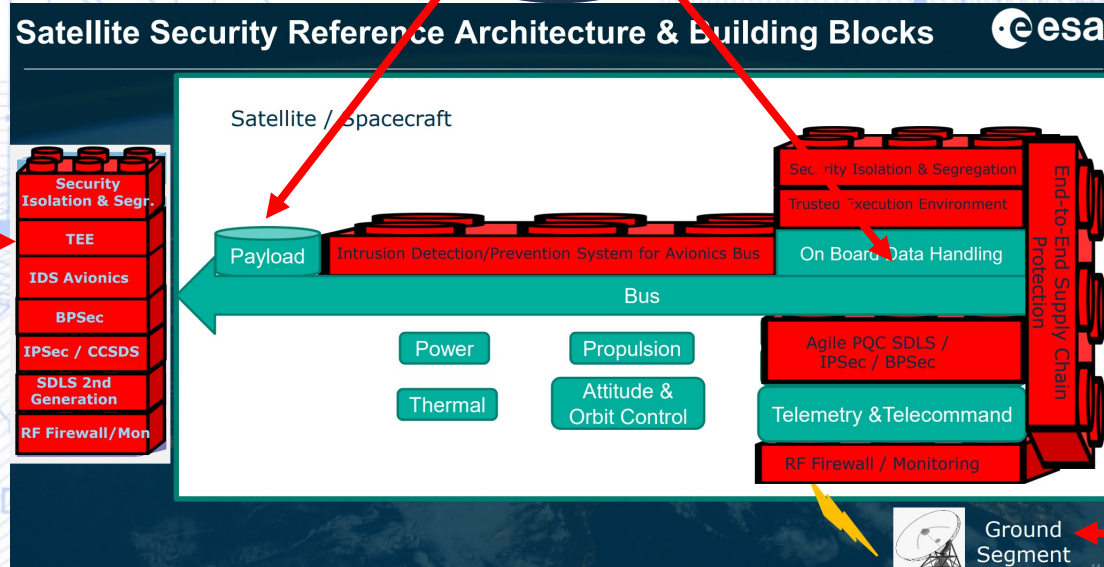


Image-source: ESA GSTP Cybersecurity Compendium Presentation 031122.pdf

Ground Stations Protectable

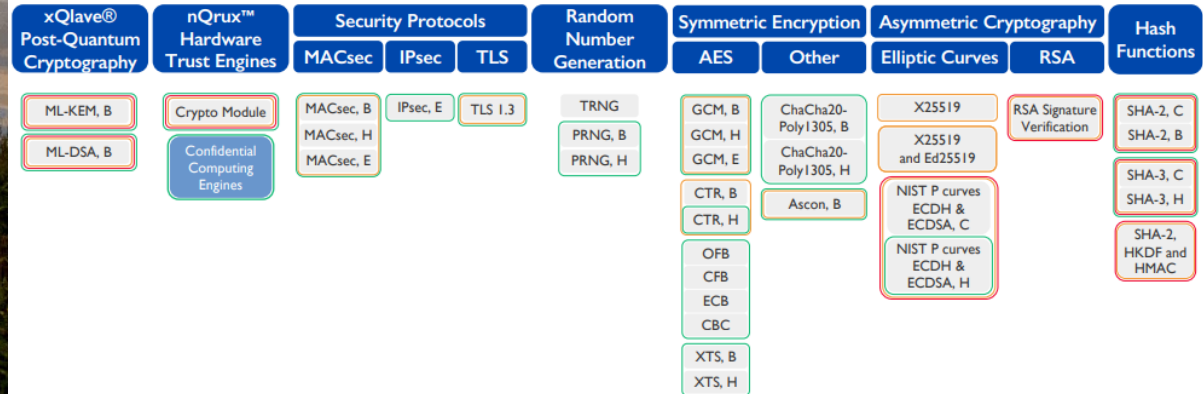


- Threat analysis and risk assessment needed
- Design security to solution from the day one
- Quantum Computing Threat requires actions
- Supply Chain Threats are real
- No more easygoing Security in Space Domain

Enable Digital Resilience today

Technology is available today

Xiphera Portfolio



The logo for XIPHERA, featuring a blue stylized 'X' icon followed by the word 'CIPHERA' in white uppercase letters, with the final 'A' in blue. The background is a wide, flat, snow-covered landscape under a dramatic sky with blue and orange tones.

XIPHERA

**Let's secure your
business together.**

Xiphera Ltd.

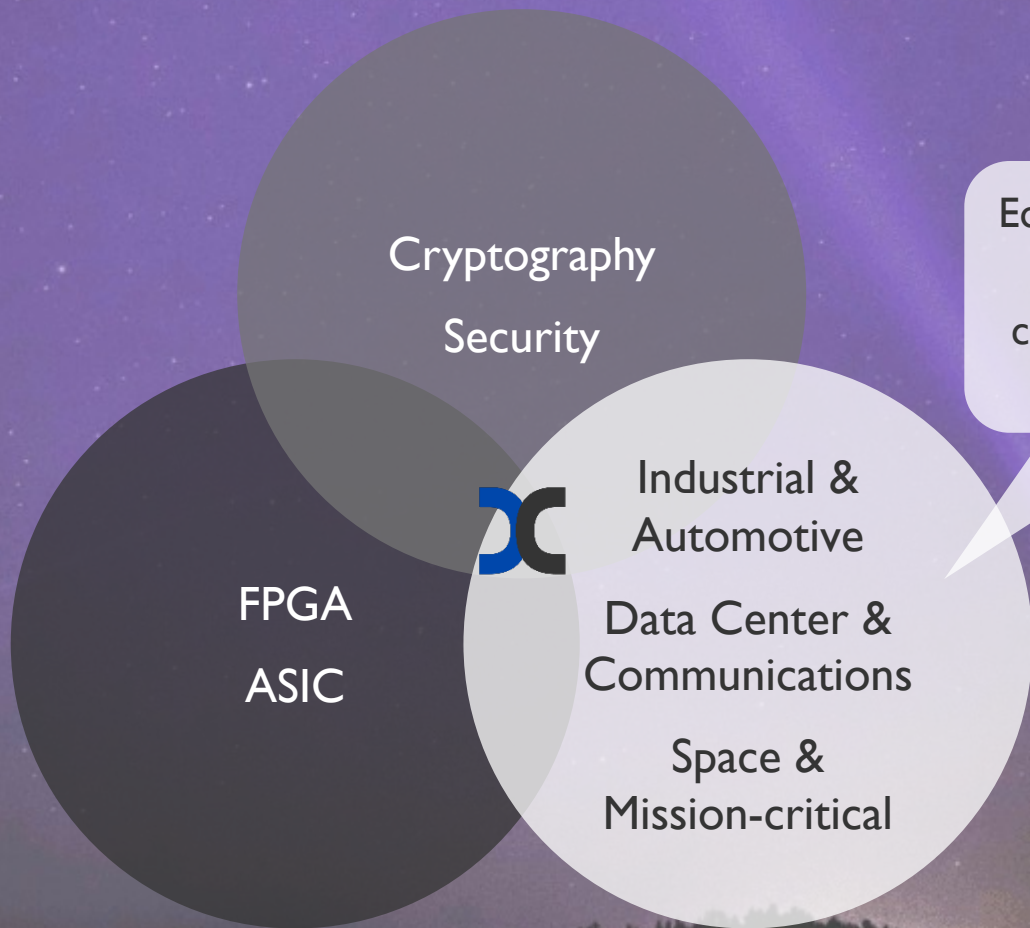
www.xiphera.com

sales@xiphera.com



Xiphera Ltd.

- Finnish company founded in 2017
- Hardware-based security solutions with standardised cryptographic algorithms
- Secure and efficient cryptographic IP cores for digital logic (FPGAs and ASICs)
- All products and solutions designed fully in-house
- Committed roadmap to future cryptographic standards



Equipment manufacturer
/ semiconductor
company targeting IIoT
security



We protect critical systems by designing security directly into hardware.



Strong technical
background in security



Broad and modern
portfolio



Uncompromised
confidentiality

The Time Is Now



**Software-based
security is
fundamentally broken**




**Chips Acts
(Europe &
USA)**



**Confidential
Computing**



Secured AI



**Post-quantum
Cryptography (PQC)
typhoon and quantum
threat**



Software vs Hardware

Security software

3rd party libraries

Toolchain

Operating System

Drivers

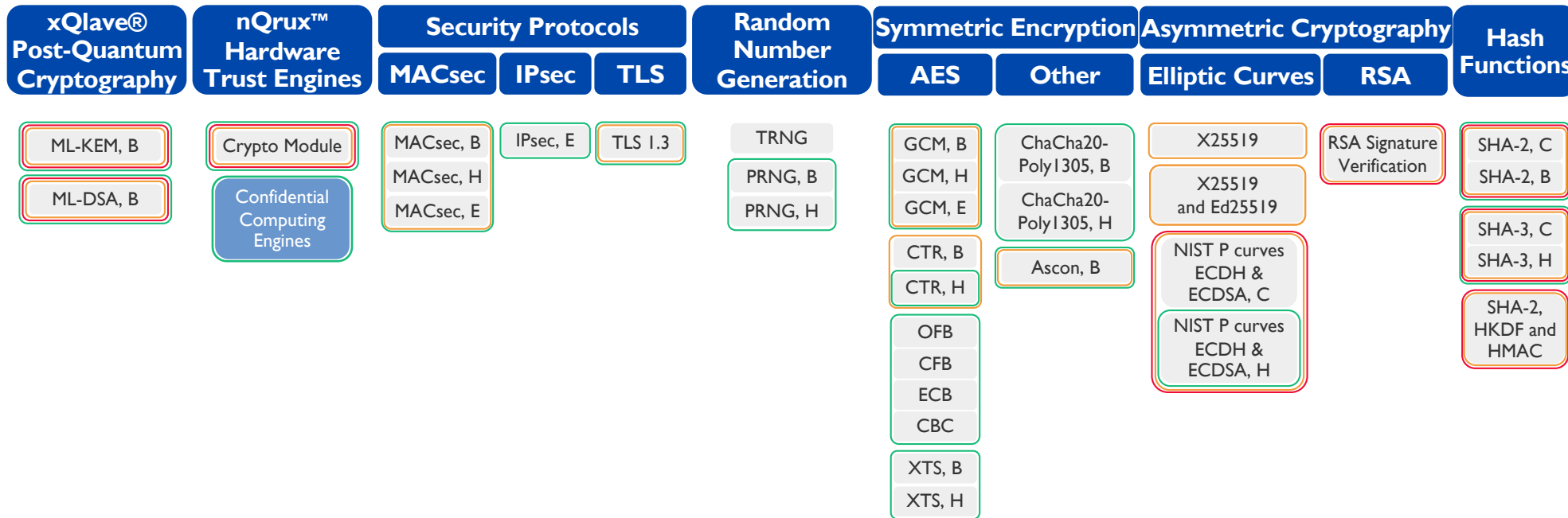
Processor

Application

FPGA/ASIC
cryptography and keys



Xiphera Portfolio



Security levels

C = Compact	128 bits
B = Balanced	192 bits
H = High-speed	256 bits
E = Extreme-speed	

Why Xiphera?



Compact / high-performance solutions



Agile and nimble team



Fully hardware-based implementations



Roadmap to future cryptographic applications



In-house designed products & cryptographic expertise



Ability to support both VHDL and SystemVerilog design flows

To Summarise



Cryptography is the foundation for security.



Xiphra protects your critical systems by designing security directly into hardware.



We have a committed roadmap for future's cryptographic standards.



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Appendix



Example Customer Cases



EMEA Satellite Tech Company

- **Customer pain:** Securing the ground station ↔ satellite communication link
- **Solution:** Xiphera AES IP core securing both confidentiality and authenticity



Abstraction Levels

