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Exploring Security Controls of Products based on CRA

5 March 2025

Angelo D'Amato
Founder

Meet your speaker

Angelo D'Amato
Founder / Cybersecurity Expert, Vulnir

Background

- With over fifteen years of experience, he is the subject matter expert for:
  - End-to-end cybersecurity assessments (Penetration testing)
  - Certifications (e.g., UL 2900, Common Criteria)
  - Regulatory compliance (e.g., Radio Equipment Directive, Cyber Resilience Act)
- I currently cover the role of rapporteur (*) for CRA as a CEN contractor within CEN/CLC/JTC 13/WG 9 for
  - PT2: Generic Security Requirements
  - PT3: Vulnerability handling requirements

* The European Union funds my activities within the STAN4CR project through the European Innovation Council and SMEs Executive Agency (EISMEA) under Grant Agreement No. 101196779.

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Agenda

01 CRA context and work program overview

02 SDL Overview

03 Security controls Framework

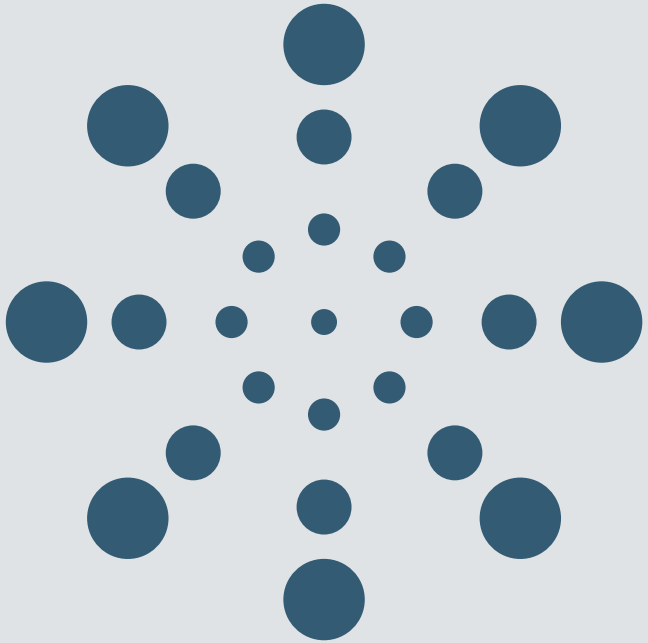
04 CRA’s Product Related essential requirements

05 Next steps

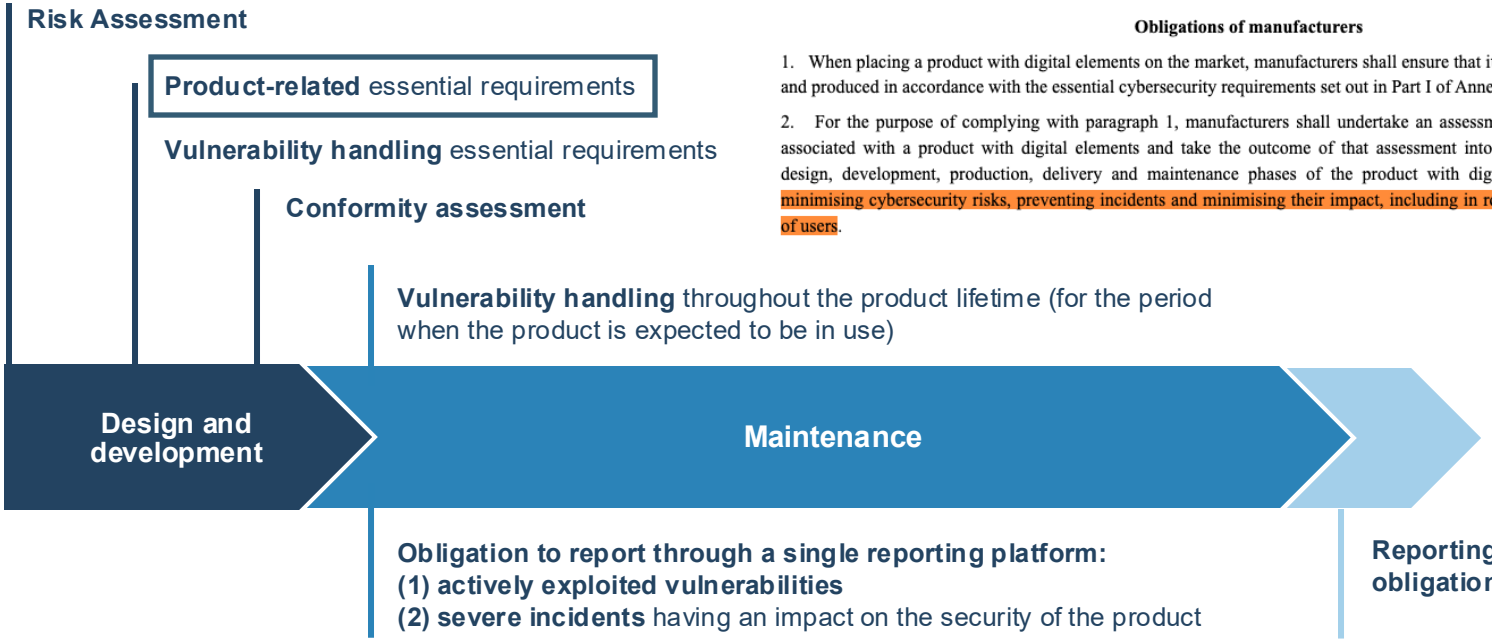
01

CRA context

CEN/CENELEC AND ETSI Work Program Overview



Obligations of manufacturers (CRA)



Article 13

Obligations of manufacturers

1. When placing a product with digital elements on the market, manufacturers shall ensure that it has been designed, developed and produced in accordance with the essential cybersecurity requirements set out in Part I of Annex I.

2. For the purpose of complying with paragraph 1, manufacturers shall undertake an assessment of the cybersecurity risks associated with a product with digital elements and take the outcome of that assessment into account during the planning, design, development, production, delivery and maintenance phases of the product with digital elements with a view to minimising cybersecurity risks, preventing incidents and minimising their impact, including in relation to the health and safety of users.

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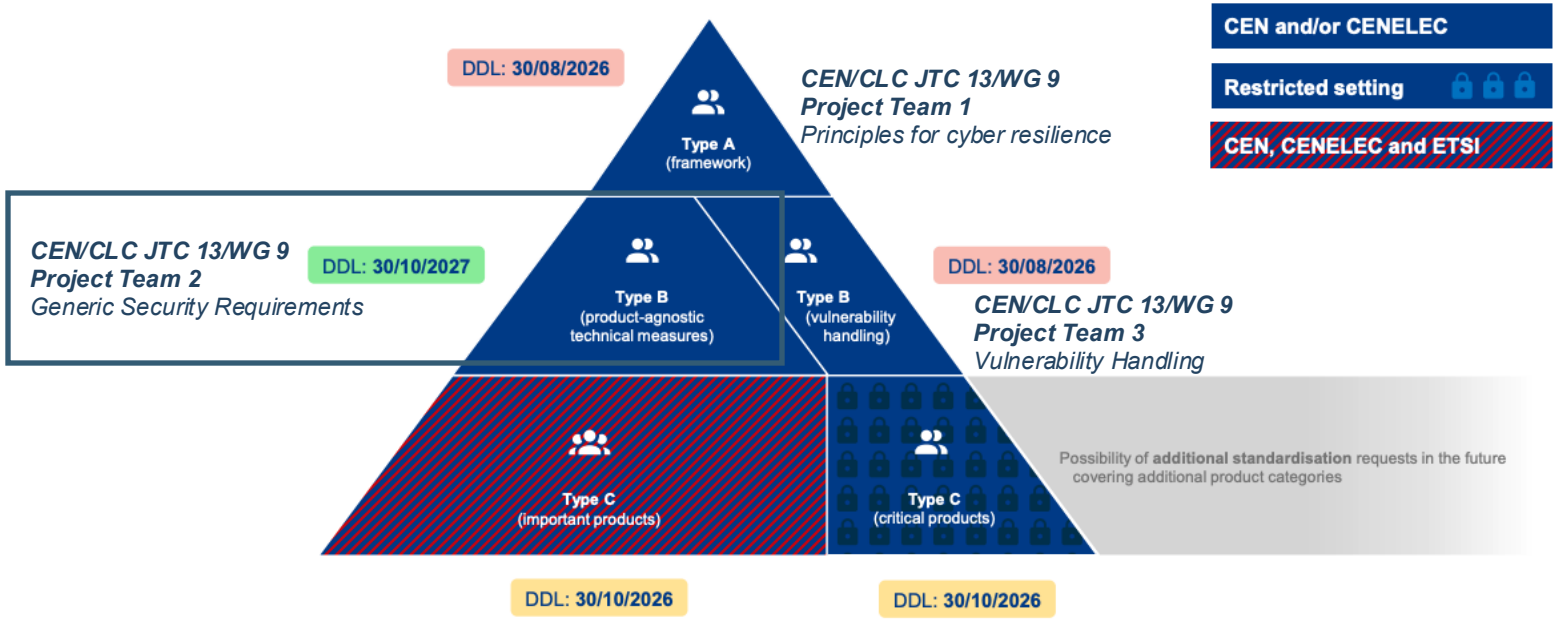
***Source**: CEN/CENELEC Webinar on 10 March 2025 – Standardisation for the Cyber Resilience Act*

European Commission

CRA standardisation request in a nutshell



European Commission

Source: *Webinar on 26 February 2025 – Co-organised by Cyberstand.eu, HSbooster.eu & Stan4CR* *The Cyber Resilience Act and where we stand*

Reference: *CEN, CENELEC and ETSI Work Programme - Version: V 0.1 - Date: 2025-04-01 –* **source:** *CYBERSTAND*.

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Exploring PT2 standard objectives

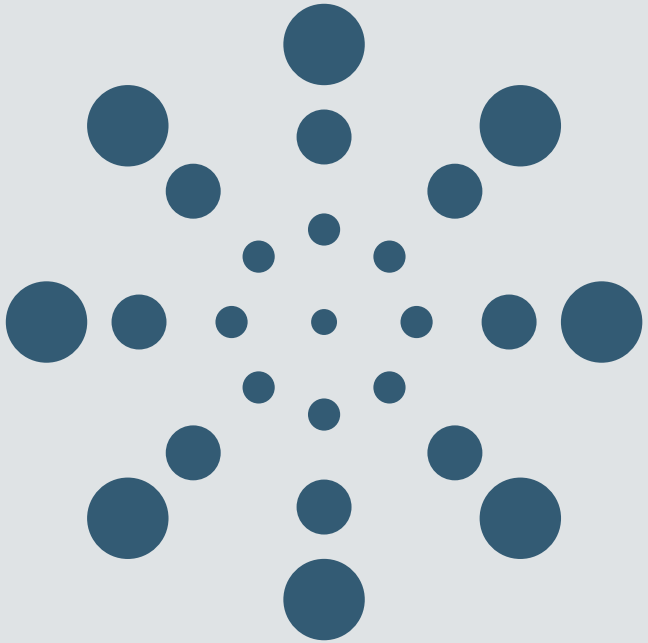
- The objective is to develop the horizontal standard for Annex I part II, the 2-14th deliverable of standardization request M/606 on Generic Security Requirements.
- The title of PT2 Standard is “Cybersecurity requirements for products with digital elements — Generic Security Requirements .”
- The PT2 is stated in the Standardization request M/606 to be published by 30/10/2027.
- The PT2 standard is product-centric—a collection of security controls and related assessment criteria.
  - It should reuse security controls already included in EN 18031-X:2024.
  - Wherever relevant, the requested horizontal standards shall include provisions on secure software development.
  - It should guide verticals and products that fall in the default category.
- PT2 standard will serve as a security control catalogue and will include at least provisions related to the
  - Security problem definition
  - Security objectives
  - Technical specification of security requirements,
  - Assessment methodology.

***Reference**: C(2025)618 – Standardisation request M/606*

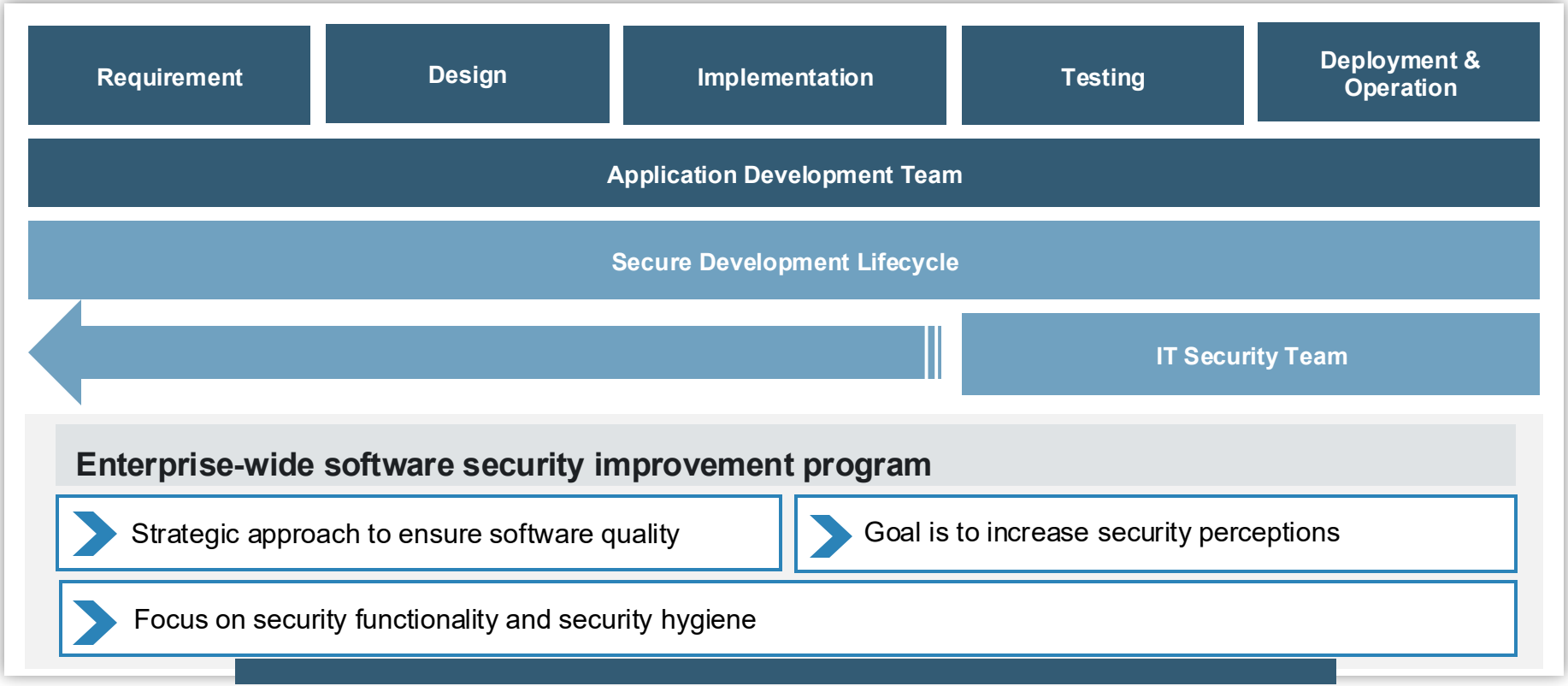
02

SDL Overview

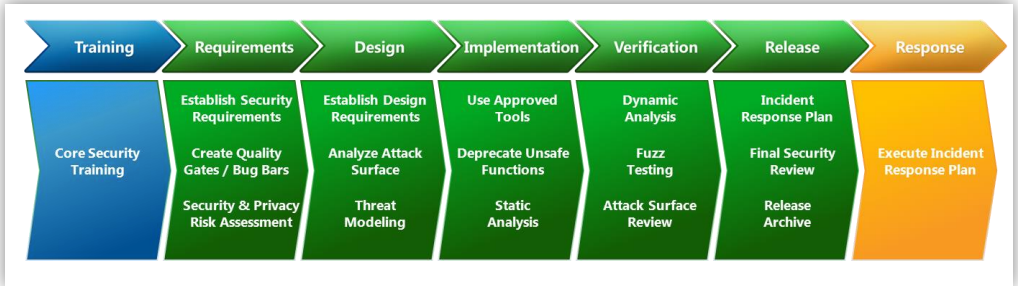
Secure Development Lifecycle



State of Practice: Integrated Security



Multiple SDL options



Microsoft SDL

Cisco SDL

OWASP SAMM

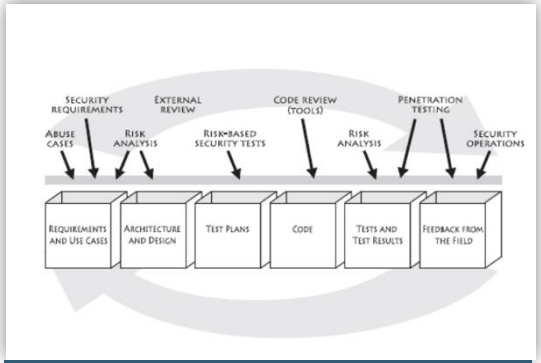
BSIMM

SAFECode
Software Assurance Forum for Excellence in Code
Driving Security and Integrity

SP 800-64

PCI SLC

ISO/IEC 27034



McGraw's TouchPoint

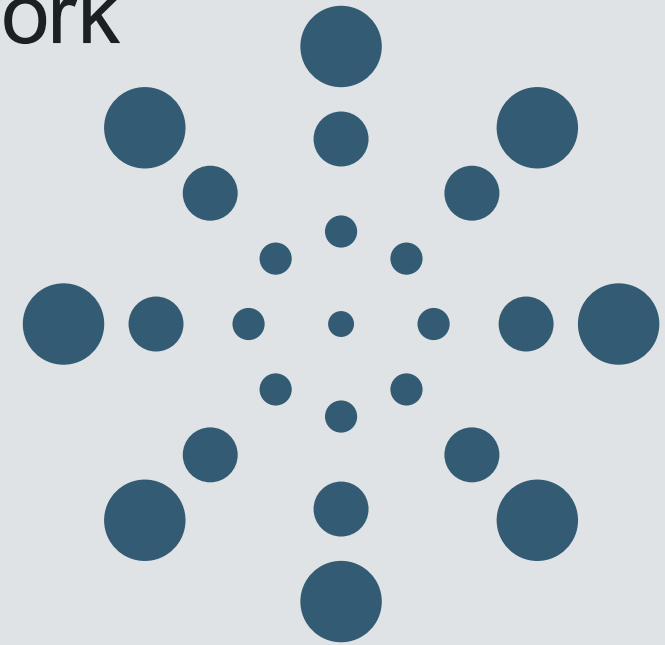
Software Engineering Institute | Carnegie Mellon University

Software Engineering Institute

And many others

03

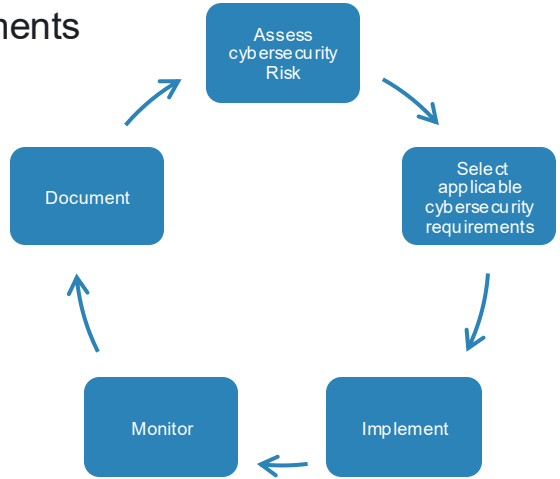
Security controls Framework

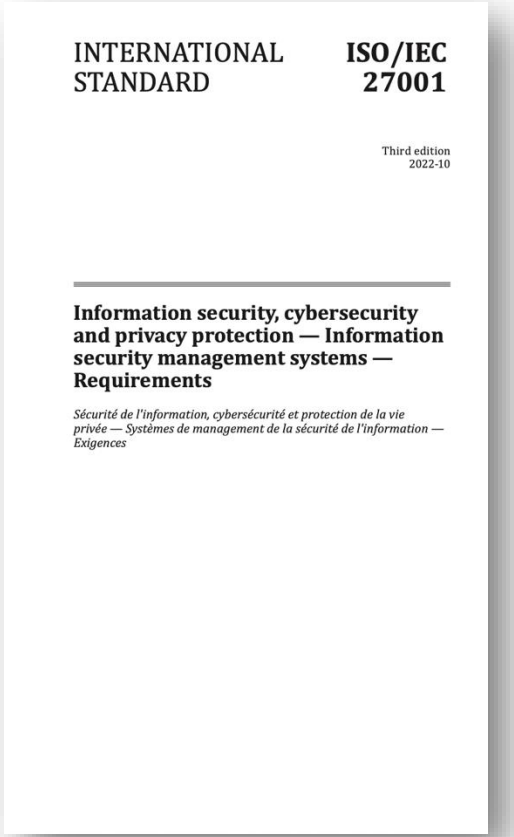


ISMS

ISO 27001 is a security standard that helps protect information assets by establishing an information security management system

- Identifying information security requirements
- Assessing information security risks
- Treating information security risks
- Selecting and implementing controls
- Monitor, maintain, and improve the effectiveness of the ISMS
- Continual improvement




INTERNATIONAL STANDARD

ISO/IEC 27001

Third edition
2022-10

Information security, cybersecurity and privacy protection — Information security management systems — Requirements

Sécurité de l'information, cybersécurité et protection de la vie privée — Systèmes de management de la sécurité de l'information — Exigences

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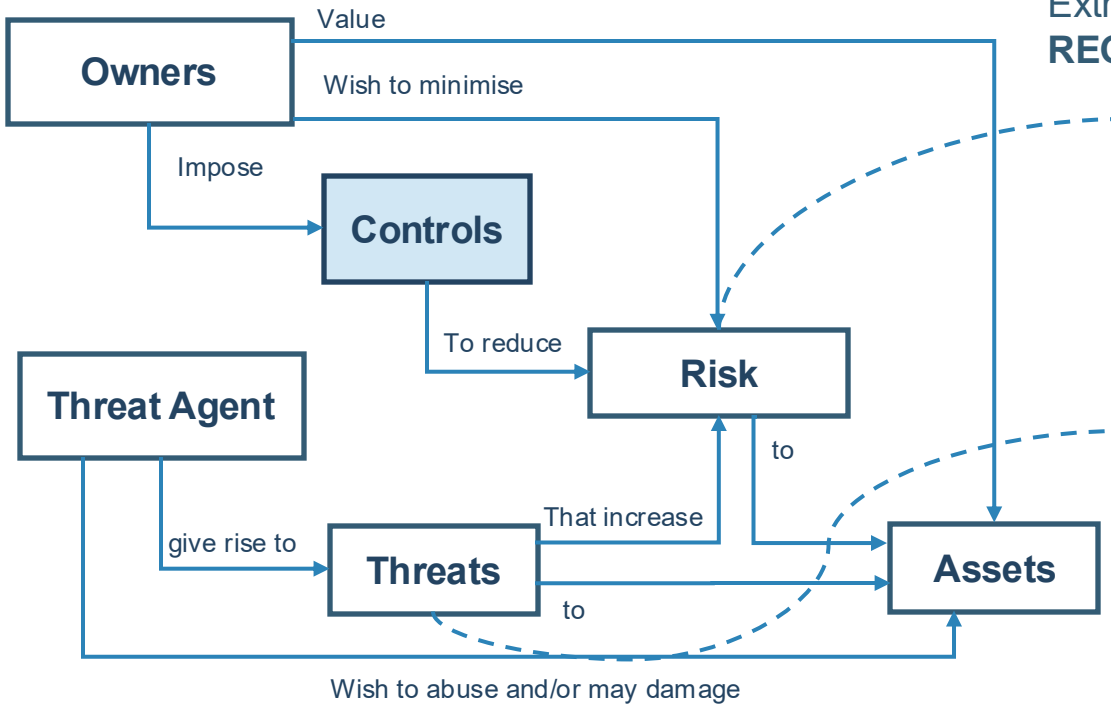
***Source**: Cyber Resilience Act Requirements Standards Mapping - [Joint Research Centre & ENISA Joint Analysis]*

Security concepts and relationships



Extract from:
REGULATION (EU) 2024/2847 (CRA)

- (37) '**cybersecurity risk**' means the potential for loss or disruption caused by an incident and is to be expressed as a combination of the magnitude of such loss or disruption and the likelihood of occurrence of the incident;

….

- (40) **'vulnerability'** means a weakness, susceptibility or flaw of a product with digital elements that can be exploited by a cyber threat;

….

***Source**: CC:2022 Part 1: Introduction and general model (CCMB-2022-11-001) – Page 37 - Figure 1 — Security concepts and relationships*

Type of Controls

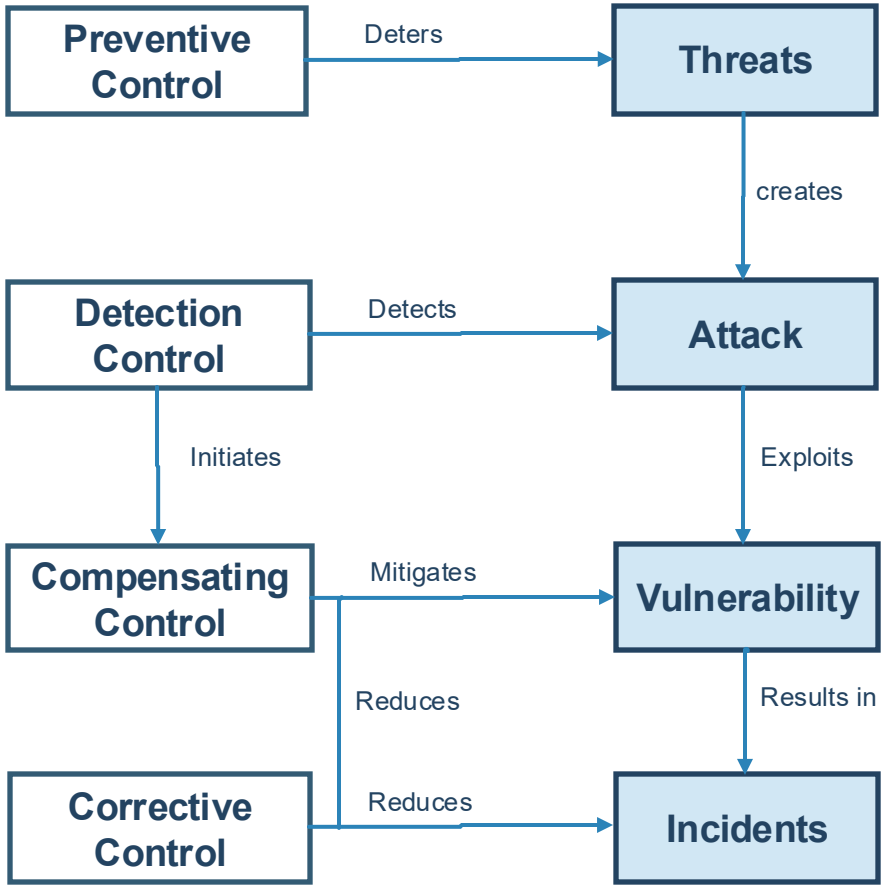
Controls are measures taken to detect, prevent, and mitigate the risks associated with the threats a system faces

Control type

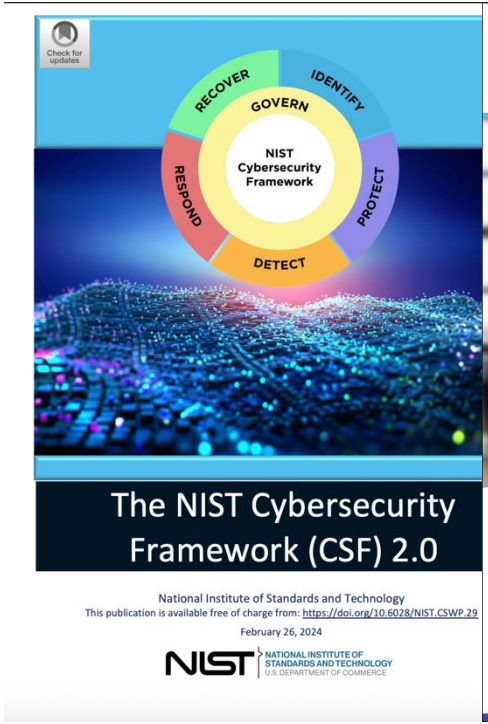
- Administrative
- Technical
- Physical

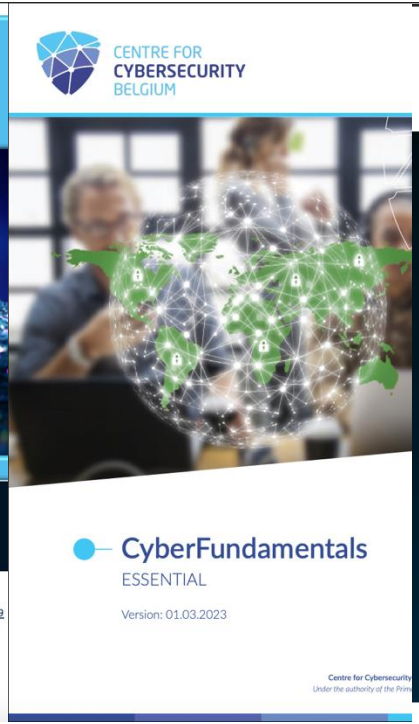
Control functions

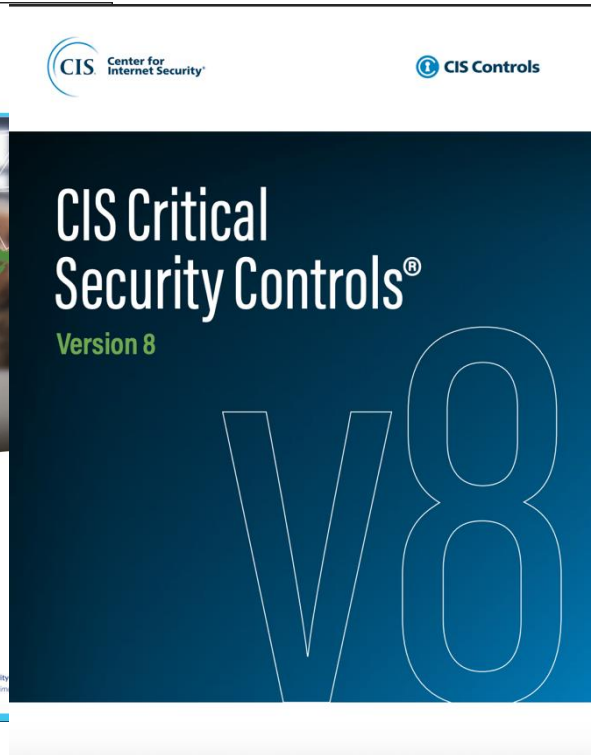
- Preventive (deterrent)
- Detective
- Corrective (recovery)
- Additional: Compensating



Example of security frameworks







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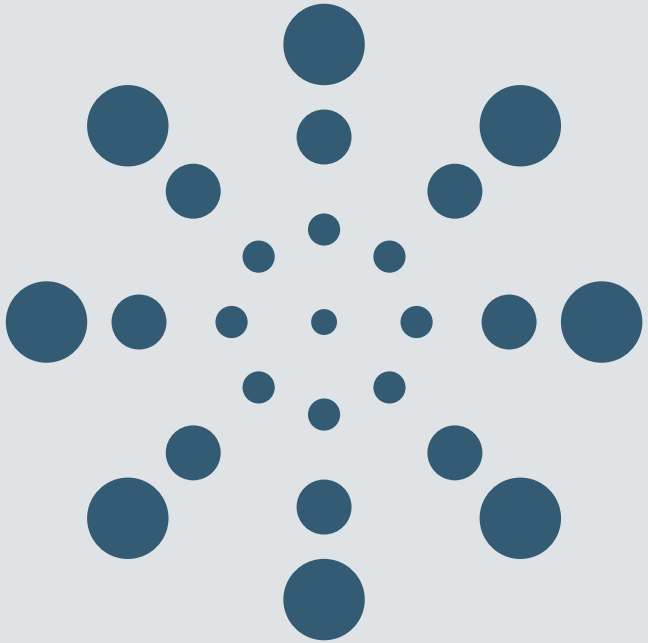
CRA

Product Related essential requirements



Role of essential requirements

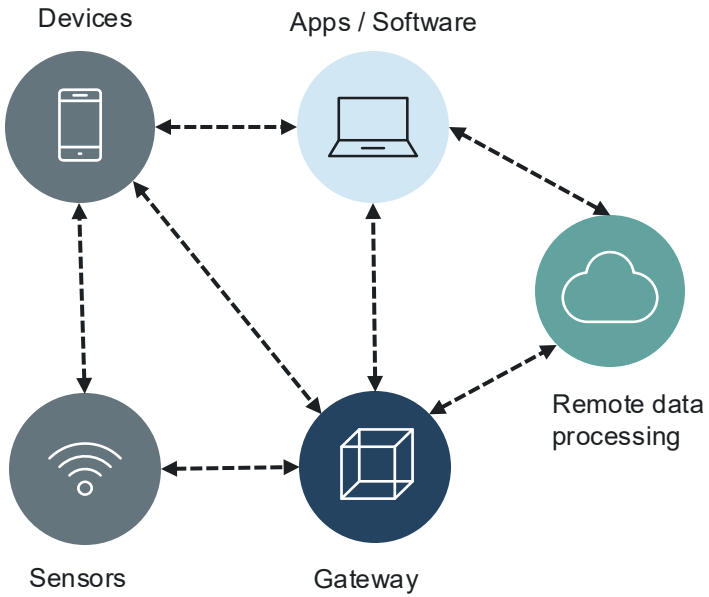
Mirai IoT Botnet, Aug 2016

- The first ever botnet of Internet of Things devices
- **Root causes**:
  - Weak default configuration (default password)
- **Effect:**
  - High-profile websites and services that relied on Dyn for DNS resolution, including Twitter, Reddit, Netflix, Airbnb, Amazon were disrupted
- **Highlighted the importance of:**
  - Secure by default configuration

Log4j (Log4Shell), Dec 2021

- The first ever botnet of Internet of Things devices
- **Root cause**:
  - JNDI lookups within log messages without sufficient validation or sanitization
- **Effect:**
  - Its impact stemmed from the ubiquitous nature of the vulnerable Log4j library and the severe nature of the vulnerability itself (Remote Code Execution).
- **Highlighted the importance of:**
  - Security updates / SBOM

Overview of the PT2's essential requirements

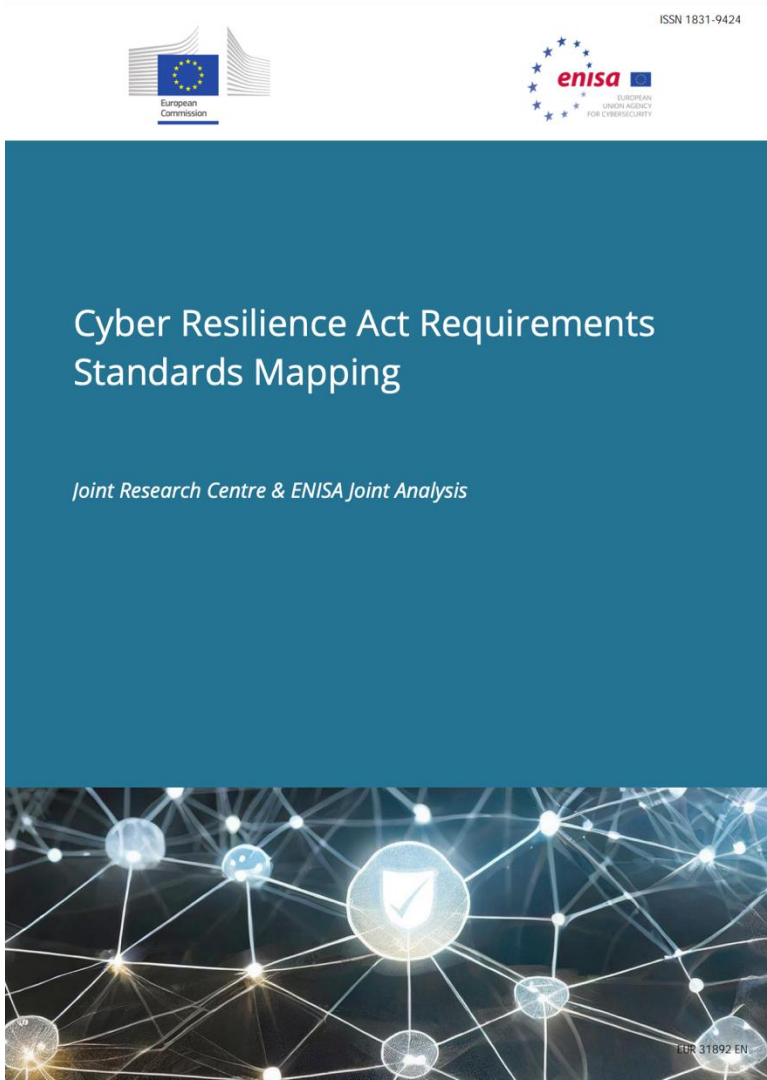


- ❑ Ensure that products with digital elements **hardware and software** placed on the EU market **have fewer cybersecurity vulnerabilities**.
- ❑ **Better protection** for consumers, supply chains, organisations, businesses, and IT Infrastructure

- No known exploitable vulnerabilities
- Secure by default configuration
- Security updates
- Authorized access
- Confidentiality protection
- Integrity protection
- Data minimization
- Availability protection
- Minimize negative impact
- Attack surface minimization
- Reduce the impact of an incident
- Logging and monitoring controls
- Secure deletion mechanisms

Gaps identified

- (1) Risk assessment not specific to the system or product design
- (2) Find the right balance in the assessment for the no known exploitable vulnerabilities (Common Criteria vs ETSI EN 303 645)
- (3 a) The particular use of non-erasable memories for configuration management is not covered.
- (3 f) More detailed guidance on the implementation of availability principles for generic user products
- (3 h) Lack of concrete requirements targeting the attack surface minimisation
- (3 i) some aspects of defence in depth, sandboxing, and certain mitigation techniques might not be explicitly covered by the selected standards
- (3 k) Do not explicitly cover the requirement of notifying users about the availability of updates.



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***Source**: Cyber Resilience Act Requirements Standards Mapping - [Joint Research Centre & ENISA Joint Analysis]*

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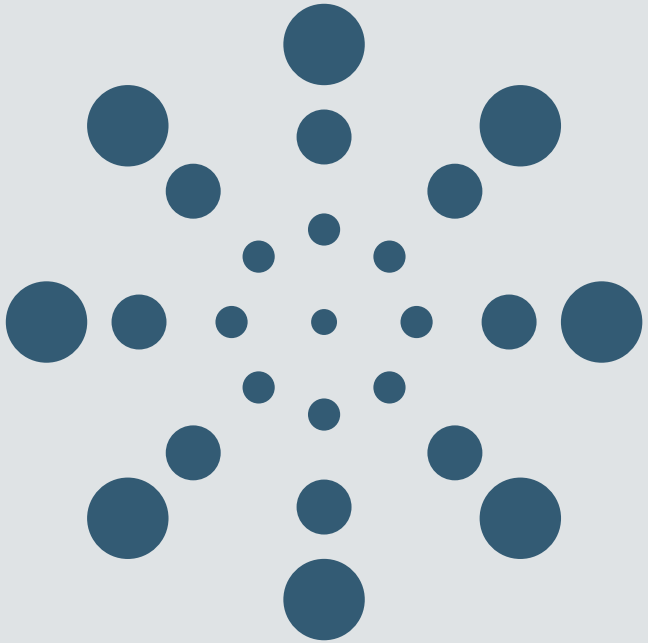
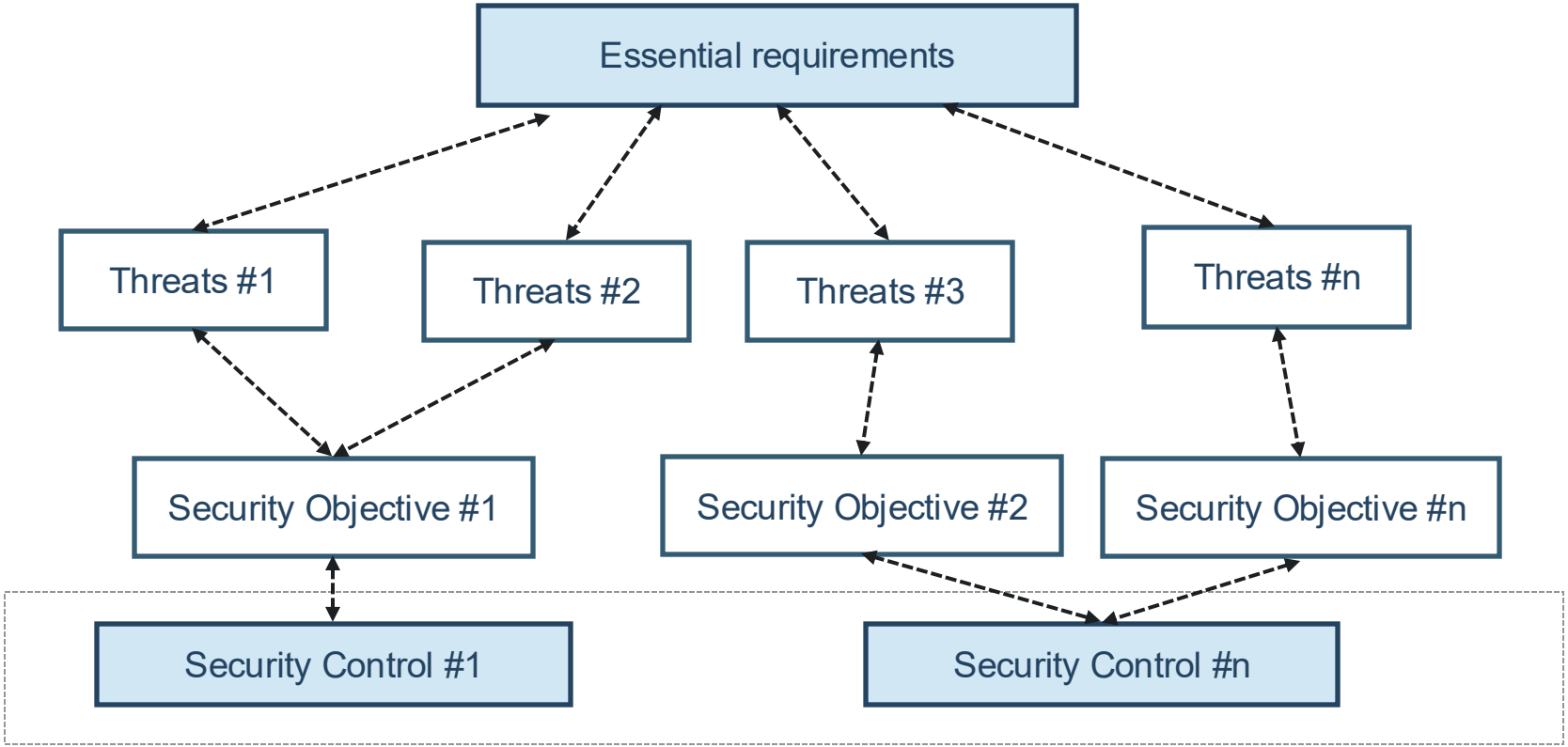
Next steps



Standard landscape as a potential reference

- Information Security Management
  - ISO/IEC 27001, ISO/IEC 27002
- Product and System Specific Security Requirements
  - ETSI EN 303 645
  - EN IEC 62443-4-2
  - EN 18031-1, EN 18031-2, EN 18031-3
- Security Evaluation and Testing
  - ISO/IEC 18045
  - EN 17640
- IoT Specifics (Architecture and Overarching Security)
  - ISO/IEC 30141
  - ISO/IEC 27400
- Privacy assurance
  - ETSI TS 103 485
- Security Throughout the Product Lifecycle
  - ISO/IEC TR 6114

Technical Report as a base for the PT2 standard



Thank you

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