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NORDIC SOFTWARE SECURITY SUMMIT
NSSS.SE
THE SOFTWARE SECURITY REGULATION REVOLUTION

Secure by Design

November 2026

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Who am I?

40 years delivering mission critical solutions across multiple sectors

Founder and Director APH10

Co-founder SBOMEurope

Open Source Software

Mentor





CoderDojo

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You can’t manage risks if you don’t understand what you are managing

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The CRA is about risk management

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The CRA is about risk management

Address **cyber risk** in digital products to **protect users of the product**

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The CRA is about risk management



Threat Modelling

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The CRA is about risk management



Threat Modelling



Security Controls

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Product Usage Risk Management

Foundation of Secure By Design

- Security requirements and architecture decisions
- Prioritisation of controls and assurance activities
- Acceptable trade-offs inherent to the intended use and deployment context
- Ongoing operational posture

Iterative process revisited at key stages of product lifecycle

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Secure by Design

- Secure by Design represents a fundamental shift in product security, embedding protective measures from conception rather than retrofitting them post-development.

- Secure by Default ensures products ship with the most secure configuration reasonably possible, reducing reliance on user expertise and limiting the potential for misconfiguration.

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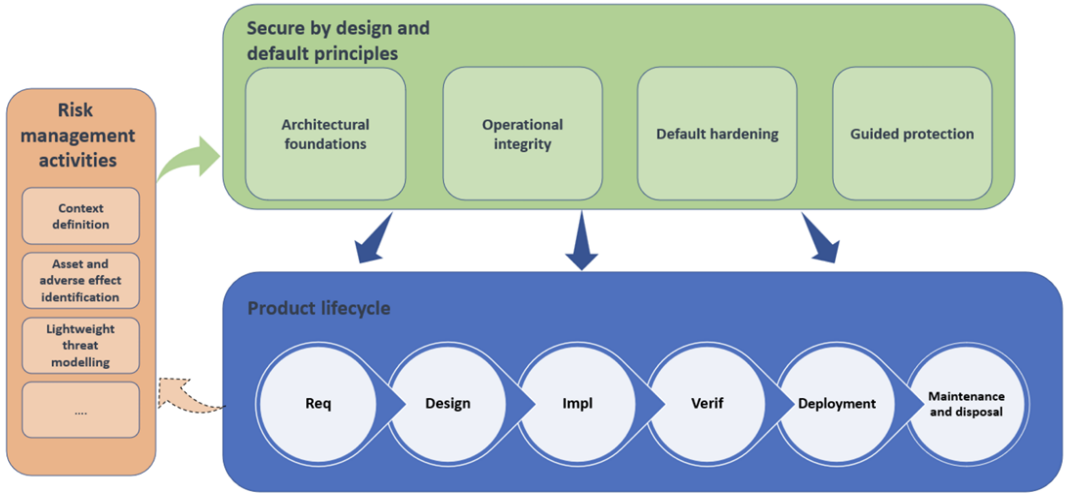

https://www.enisa.europa.eu/publications/enisa-technical-advisory-for-software-bill-of-materials

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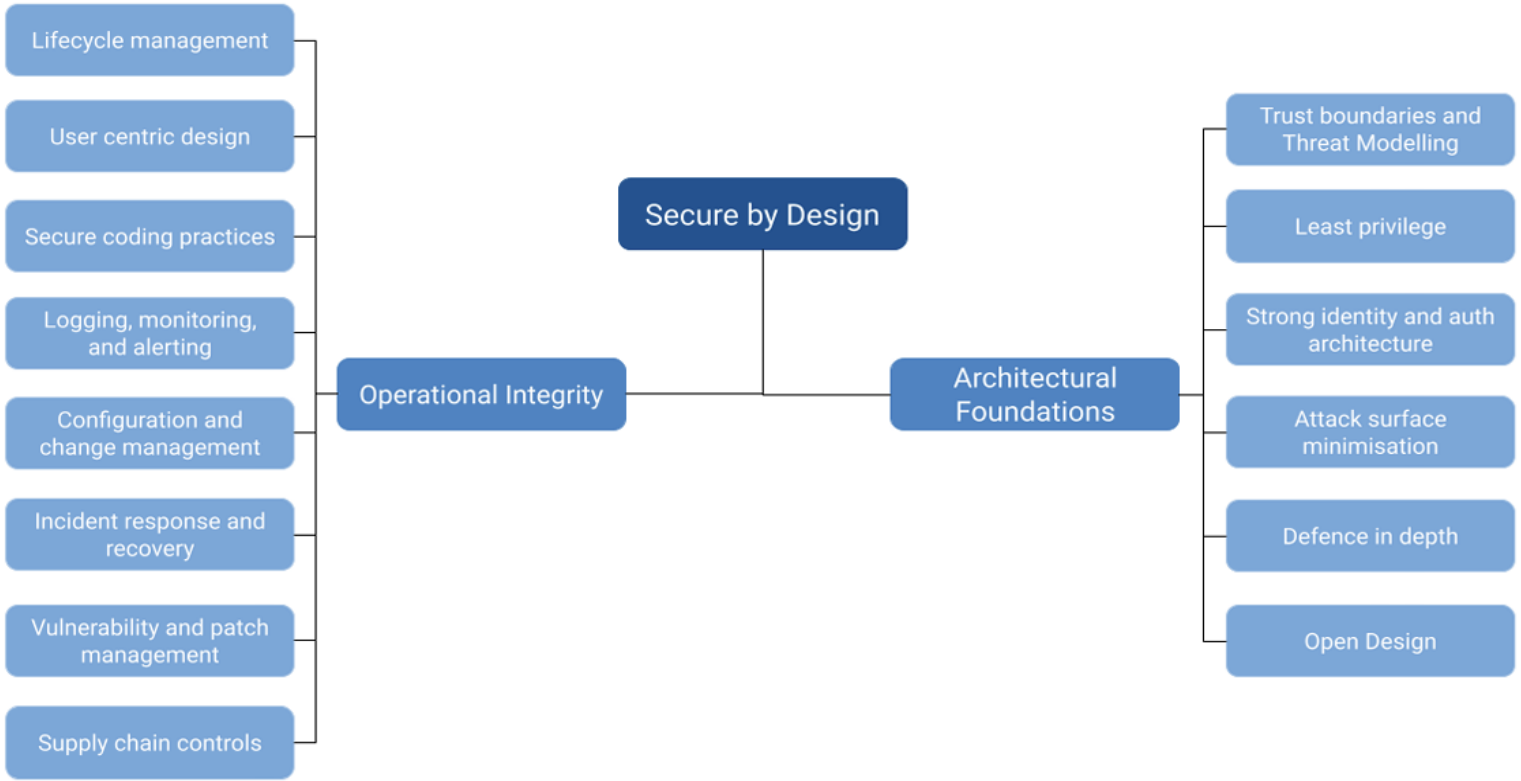
ENISA Secure by Design Principles



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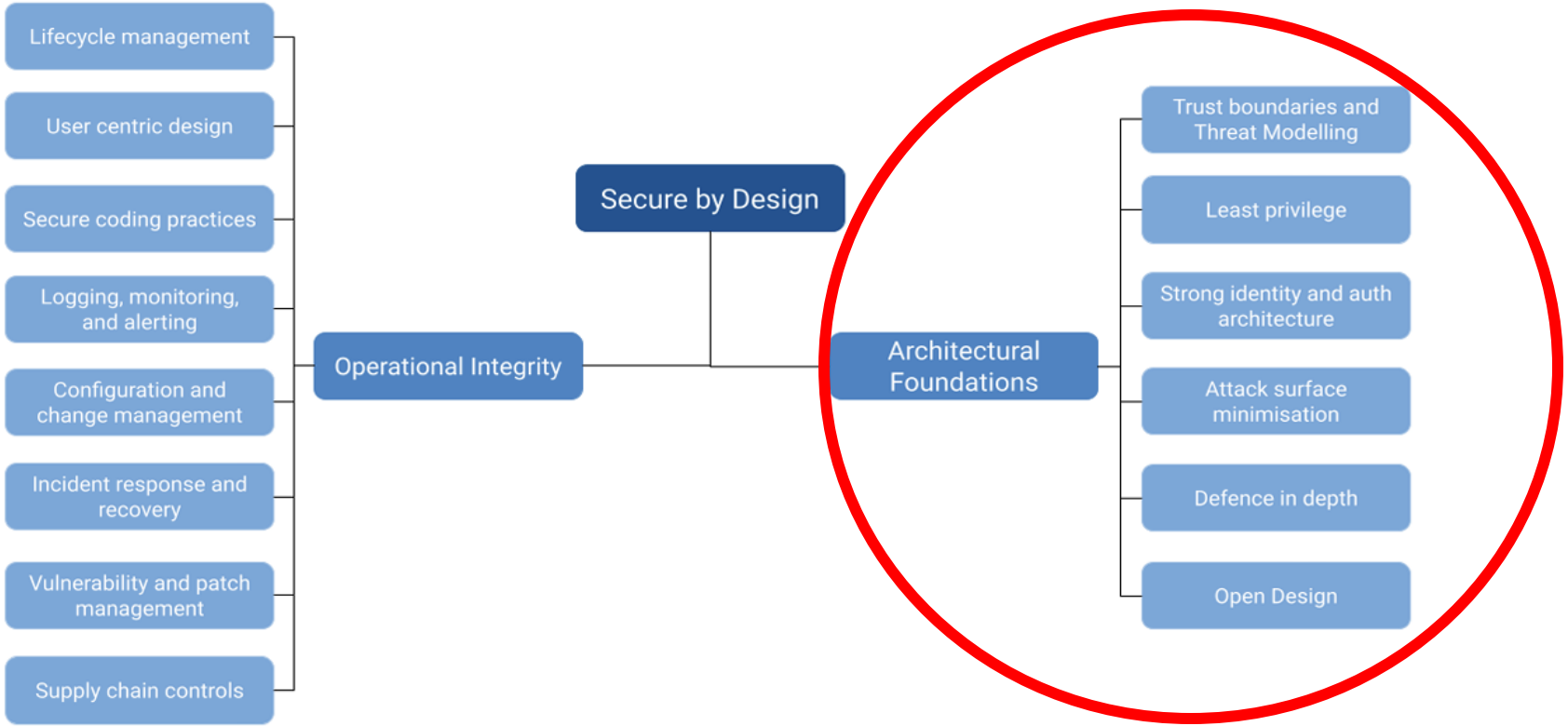
ENISA Secure by Design Principles



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Understanding ENISA Secure by Design (SbD)

- Secure Defaults
  - Is the component configured to be secure out-of-the-box?
- Least Privilege
  - Does the component request only the permissions it strictly needs?
- Defence in Depth
  - Does it have redundant security controls?
- Visibility and Transparency
  - Is the component's internal logic and data flow auditable?
- Resilience
  - How does the component handle unexpected inputs or failures?

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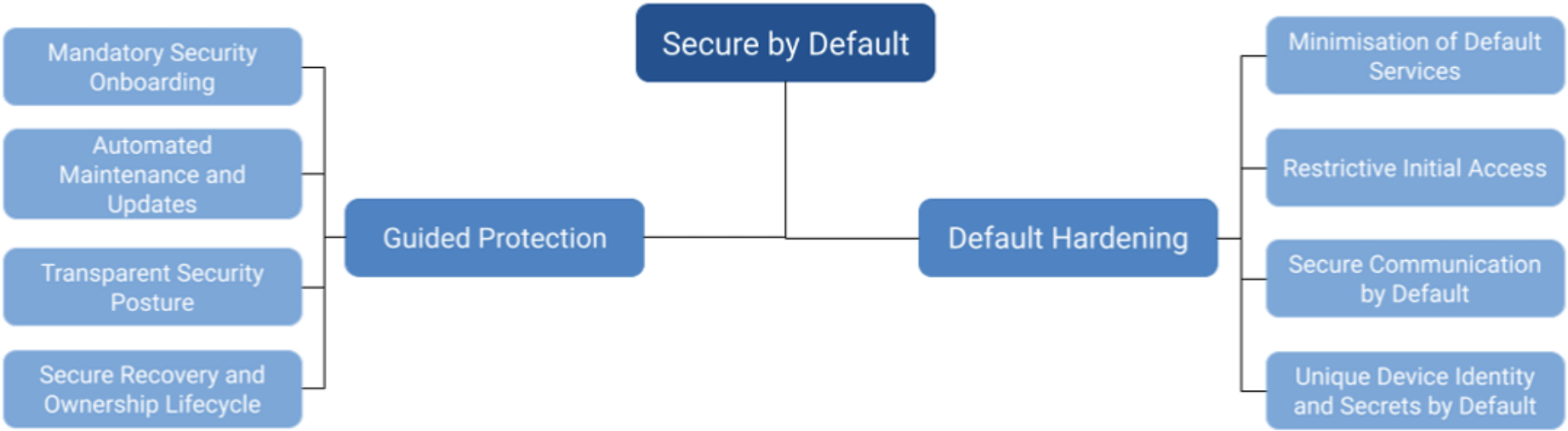
ENISA Secure Defaults



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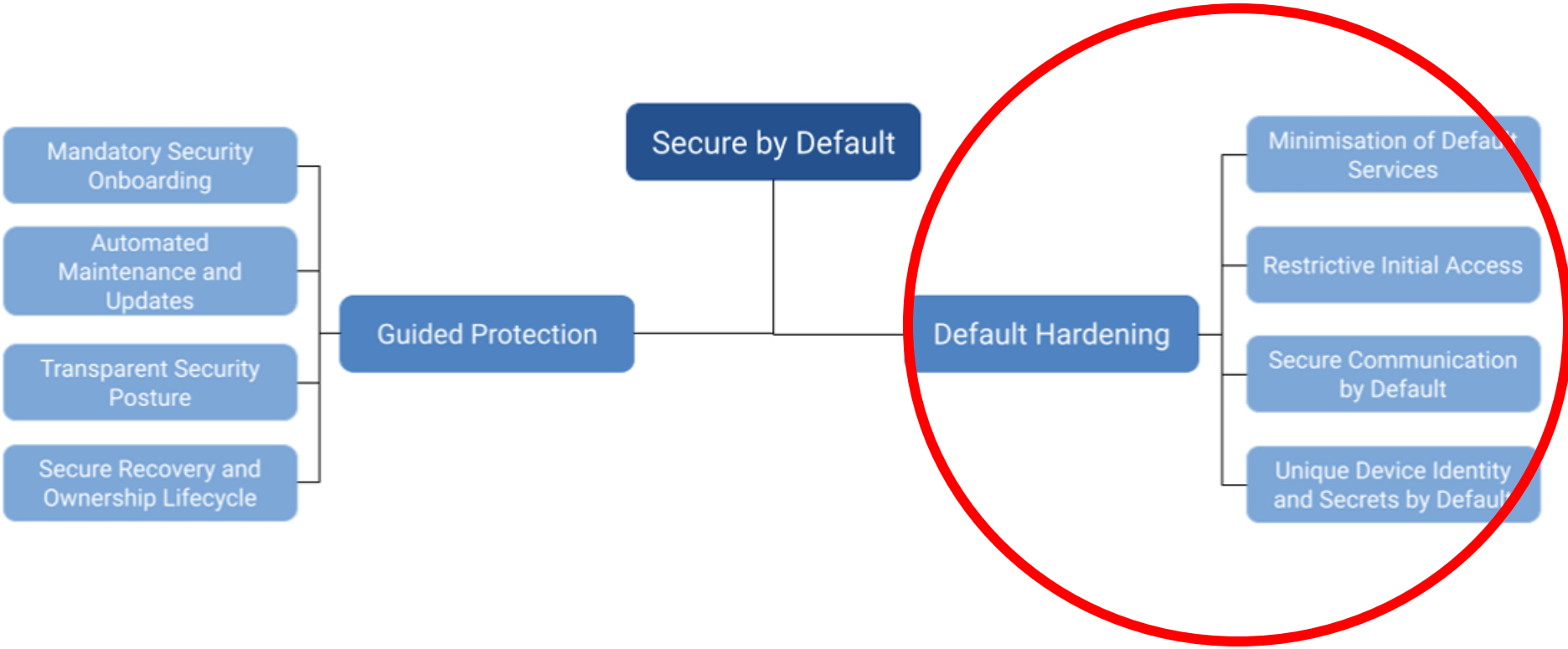
ENISA Secure Defaults



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Mapping ENISA controls to NIST 800-53

SbD Principle	Core Objective	Primary NIST 800-53 Families
Secure Defaults	Ensure out-of-the-box security	AC (Access Control), CM (Configuration Management)
Least Privilege	Minimise permissions	AC (Access Control)
Defence in Depth	Redundant security layers	SC (System and Communications Protection) SI (System and Info Integrity)
Identity and Authentication	Enforce roles and unique identities	IA (Identification and Authentication)
Attack Surface Minimisation	Only essential capabilities	CM (Configuration Management SA (System and Services Acquisition)

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The Challenge of Software Supply Chain Security

- Knowing a component exists (inventory) is no longer enough.
  - Need to know the security posture of that component.

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- How do we communicate that a component adheres to ENISA's Secure by Design (SbD) principles?

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The Challenge of Software Supply Chain Security

- Knowing a component exists (inventory) is no longer enough.
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Moving a SBOM from "Component Inventory" to "Security Attribute Inventory"

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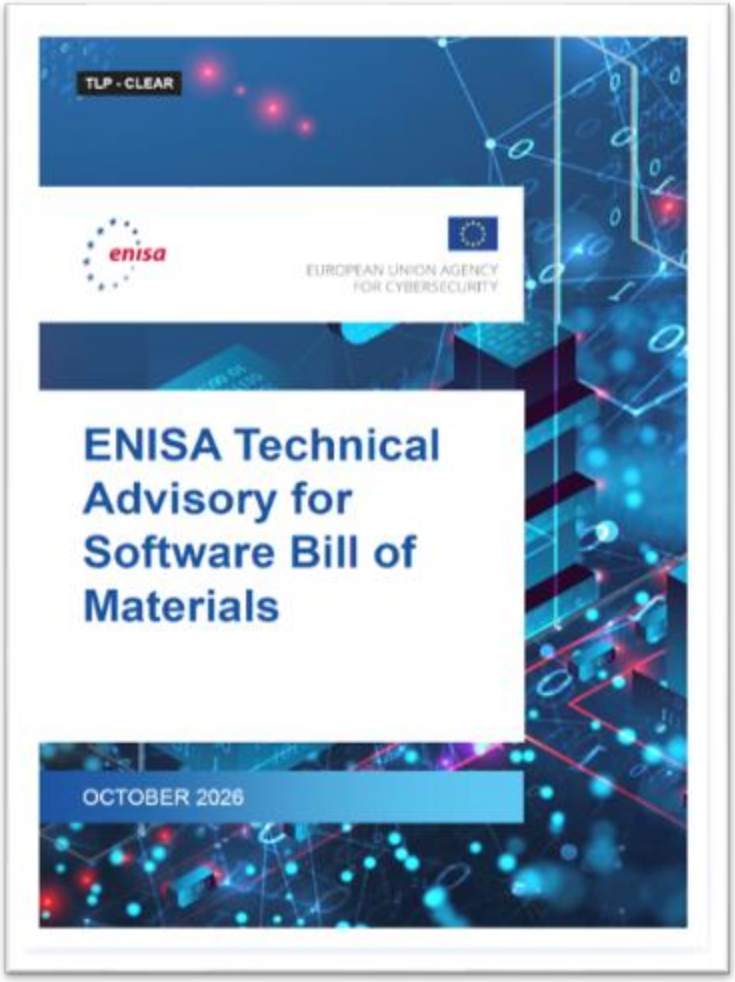

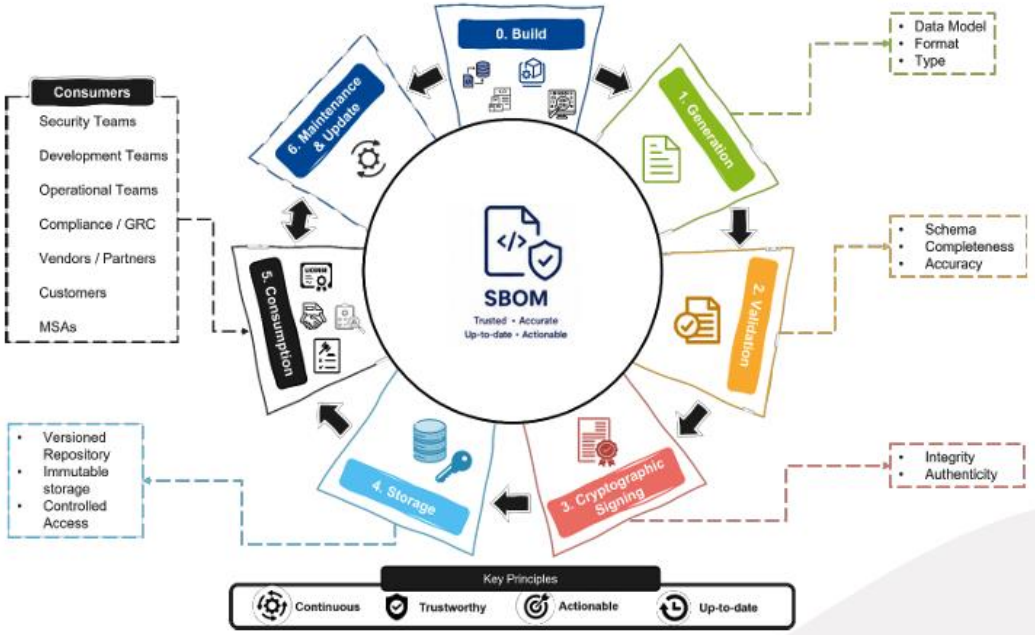

https://www.enisa.europa.eu/publications/enisa-secure-by-design-and-default-playbook

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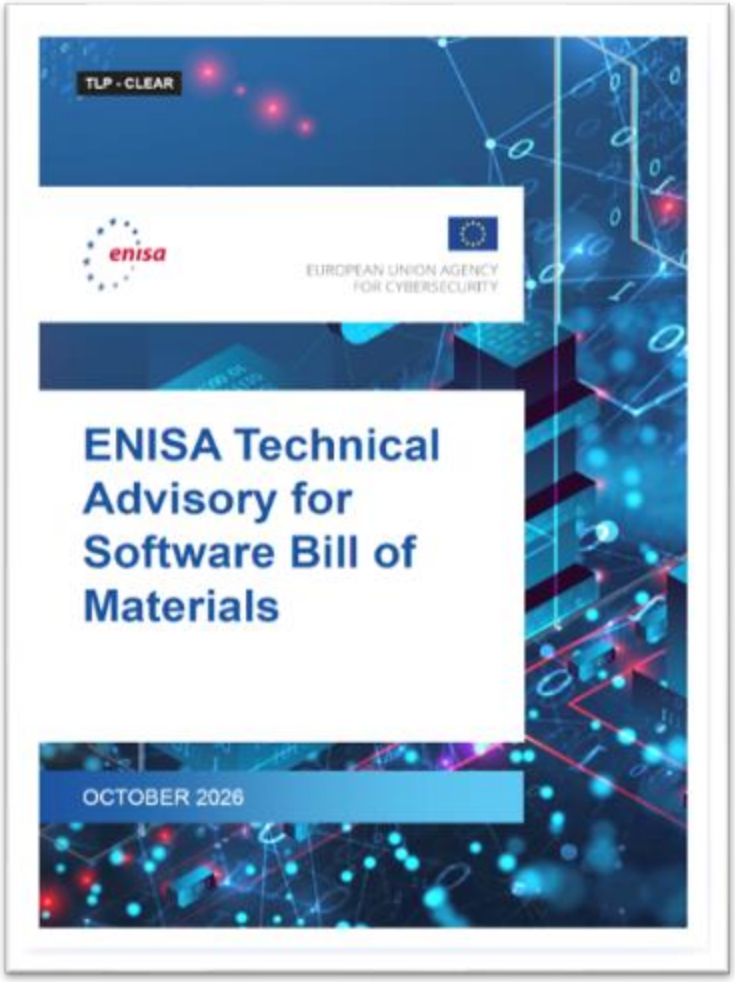

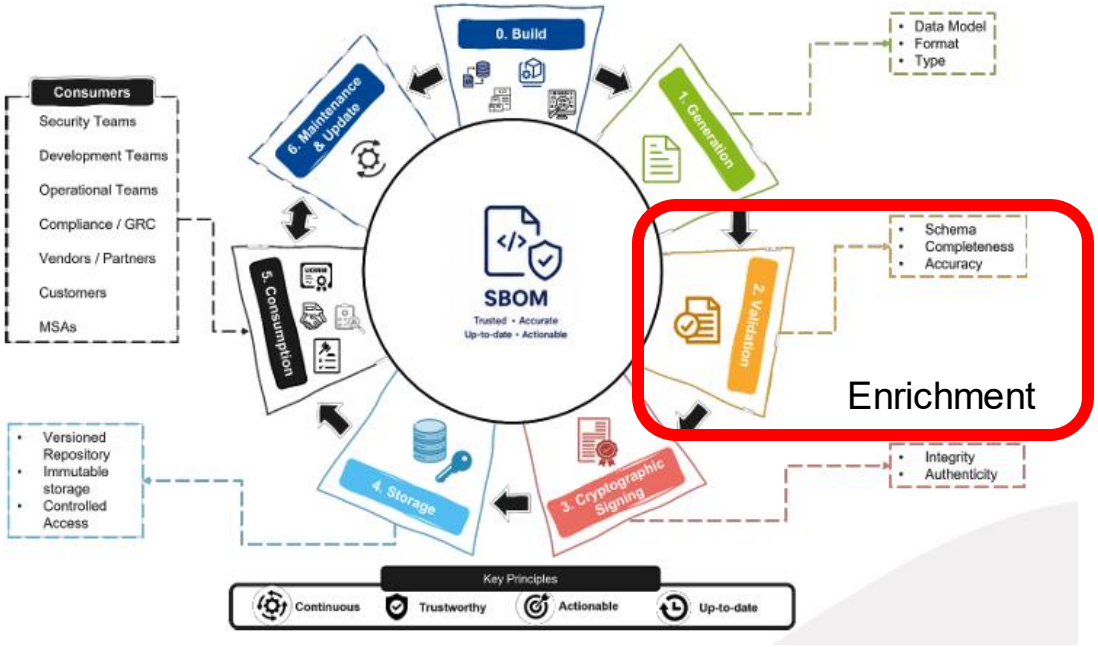

https://www.enisa.europa.eu/publications/enisa-secure-by-design-and-default-playbook

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The Proposed Approach: "Property-Based Attribution"

- Use user defined properties field to map specific ENISA principles to specific components.
  - Available in CycloneDX (all versions) and SPDX (from version 3.0)

- The Strategy
  - Identify the Principle: (e.g. Secure Defaults).
  - Define the Metric: (e.g. "Is MFA enforced by default?").
  - Assign the Property: Attach a boolean or descriptive value to the component(s) in the SBOM

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The Proposed Approach: "Property-Based Attribution"

- Example Property Mapping:
  - enisa-sbd:secure-defaults: true
  - enisa-sbd:least-privilege: restricted-access-only
  - enisa-sbd:defence-in-depth: enabled
- Create ENISA-sbd taxonomy based on ENISA SbD Playbook

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The Proposed Approach: "Property-Based Attribution"

```
{
"type": "component",
"name": "Auth-Library-v2.1",
"version": "2.1.0",
"description": "Handles user authentication and session
management.",
"properties": [
{ "name": "enisa-sbd:compliance", "value": "verified" },
{ "name": "enisa-sbd:secure-defaults", "value": "true" },
{ "name": "enisa-sbd:least-privilege", "value": "enforced" }
]
}
```

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From code to compliance

Design Phase

- Threat modelling identifies the controls to mitigate the risk
- Architects identify the required ENISA SbD principles for a new feature.
- Design SBOM identifies features with SbD mapping

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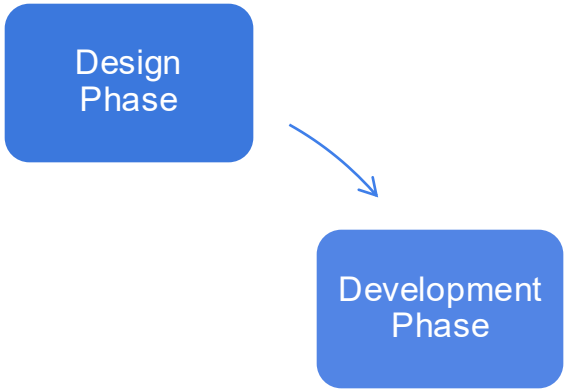
From code to compliance



- Developers implement the feature (e.g. enforcing MFA).
- Source SBOM linked to Design SBOM
- Developers identify components implementing features

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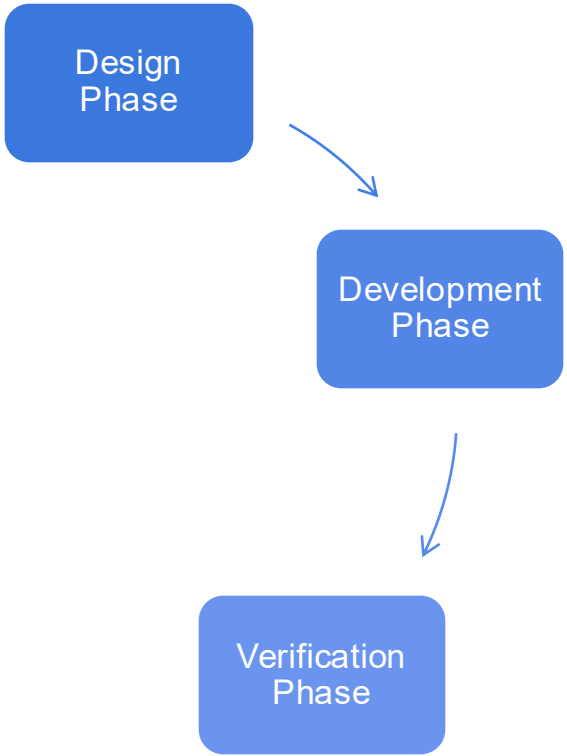
From code to compliance



- Security Team verifies the implementation against threat model

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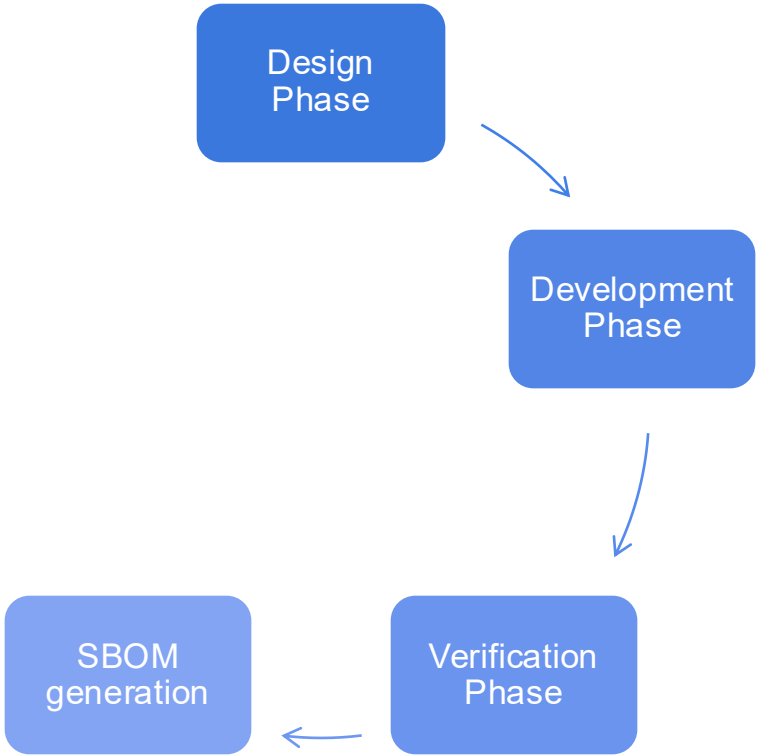
From code to compliance



- The CI/CD pipeline injects the verified properties into the SBOM file.
- Build SBOM linked from Source SBOM

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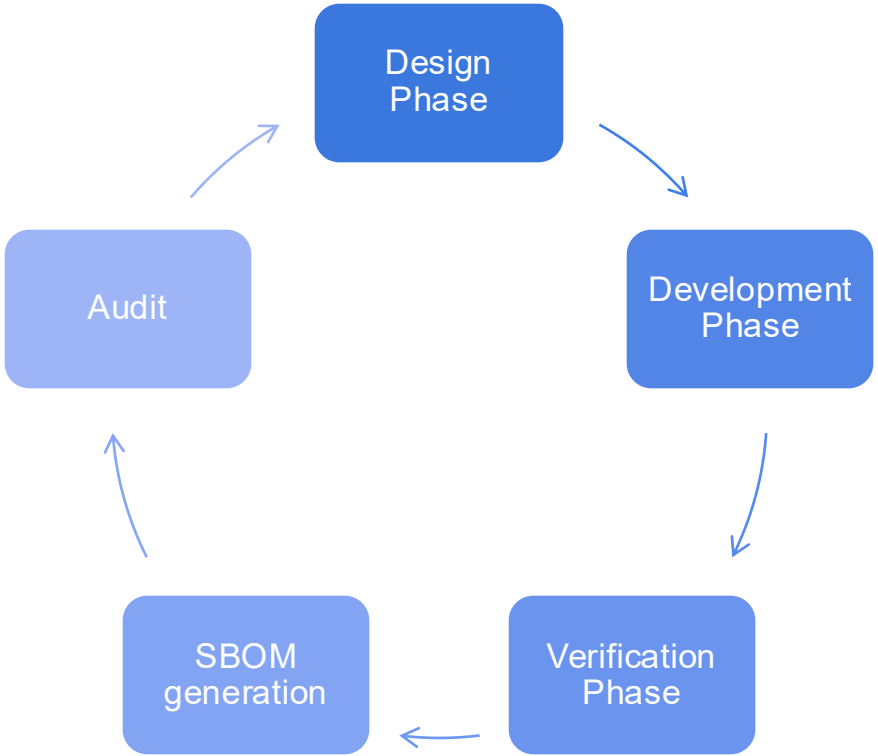
From code to compliance



- Compliance dashboard flags any component missing a required mapping.

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Summary

- By mapping ENISA principles to security controls (e.g. NIST 800-53) within an SBOM, we can create a Traceable Security Flow
- Next Steps
  - Standardise the Taxonomy
    - Define exactly what "least privilege" looks like
  - Schema Definition
    - Establish the list of required enisa-sbd and nist-800-53 properties
  - Pilot
    - Integrate these properties into a product SBOM
  - Investigate linkage with Threat Modelling (CycloneDX 2.0)

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