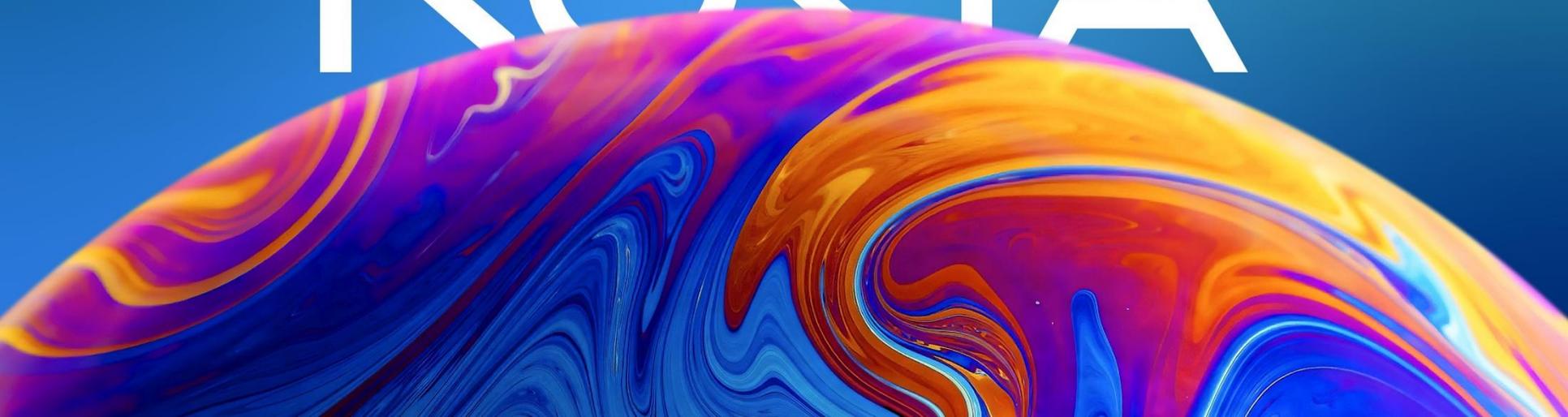


Design for Security (DFSEC)

NOKIA



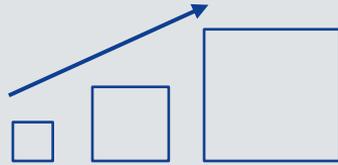
Solutions for the Programmable World

Secure. Automated. Trusted. Reliable.

Security by Design

Scalable

to meet the rising security and privacy demands of 5G, IoT...



Integrated

as a part of our product creation, security baked-into 100% of products as a part of our product creation

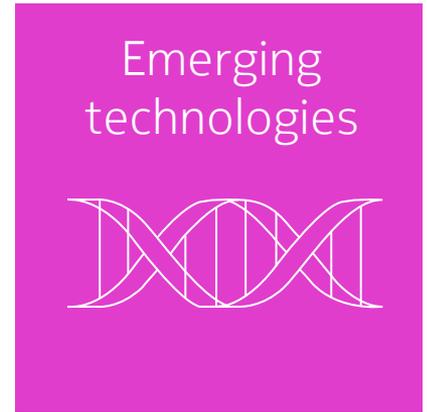
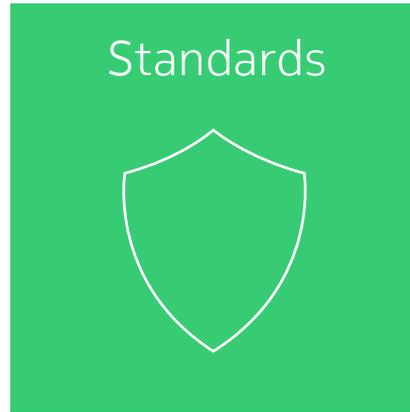


Automated

through threat intelligence, efficient correlation, Continuous Integration.



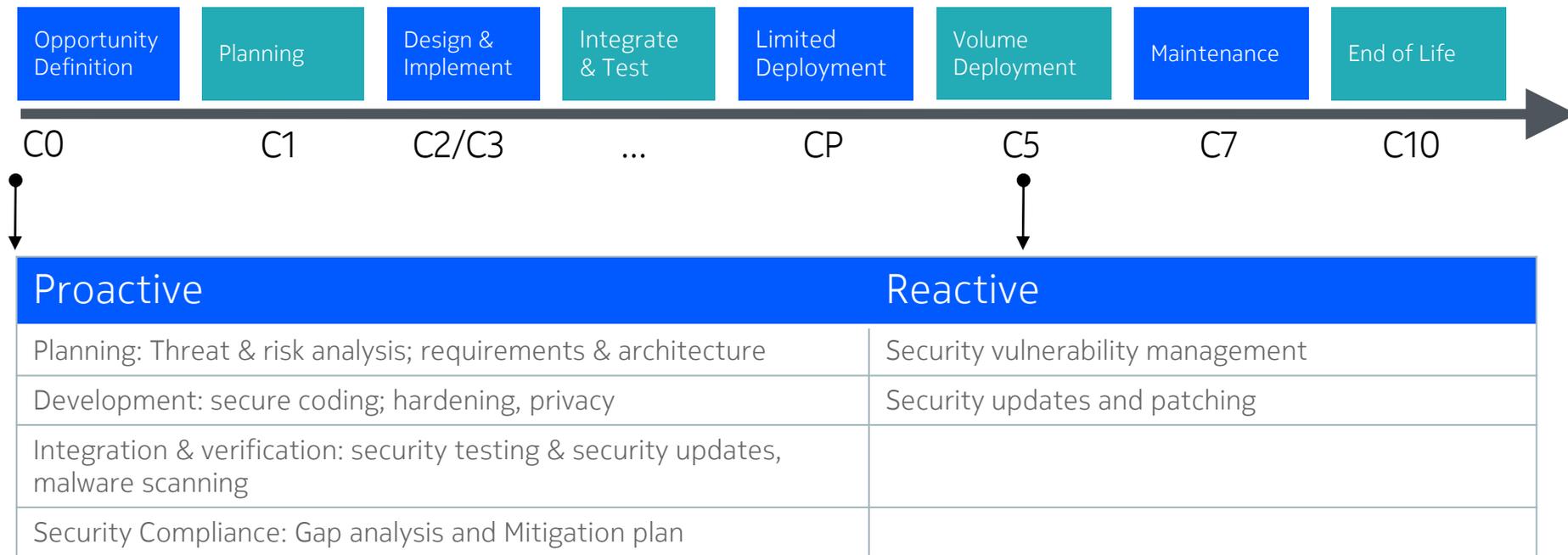
Nokia Design for Security



- Scope of coverage: process, people, technology
- Implementation: proactive & reactive measures, flexible to work with new technologies & requirements

Security baked into Nokia product life-cycle “CREATE”

Nokia Design for Security (DFSEC)



A flexible framework to incorporate emerging technologies & requirements

Design for Security

Key components of Security Management Process

Proactive

Design for Security (DFSEC)

Feature screening

- Security threat & risk analysis
- Privacy Impact Assessment

Systems engineering

- Security & privacy requirements
- Security architecture specification

Development

- Secure coding
- Source Code security testing
- Product hardening

Integration & verification

- Security testing
- Malware scanning
- Data Scrambling verification (privacy)

Compliance: Gap analysis and Mitigation plan

Reactive

Security vulnerability management

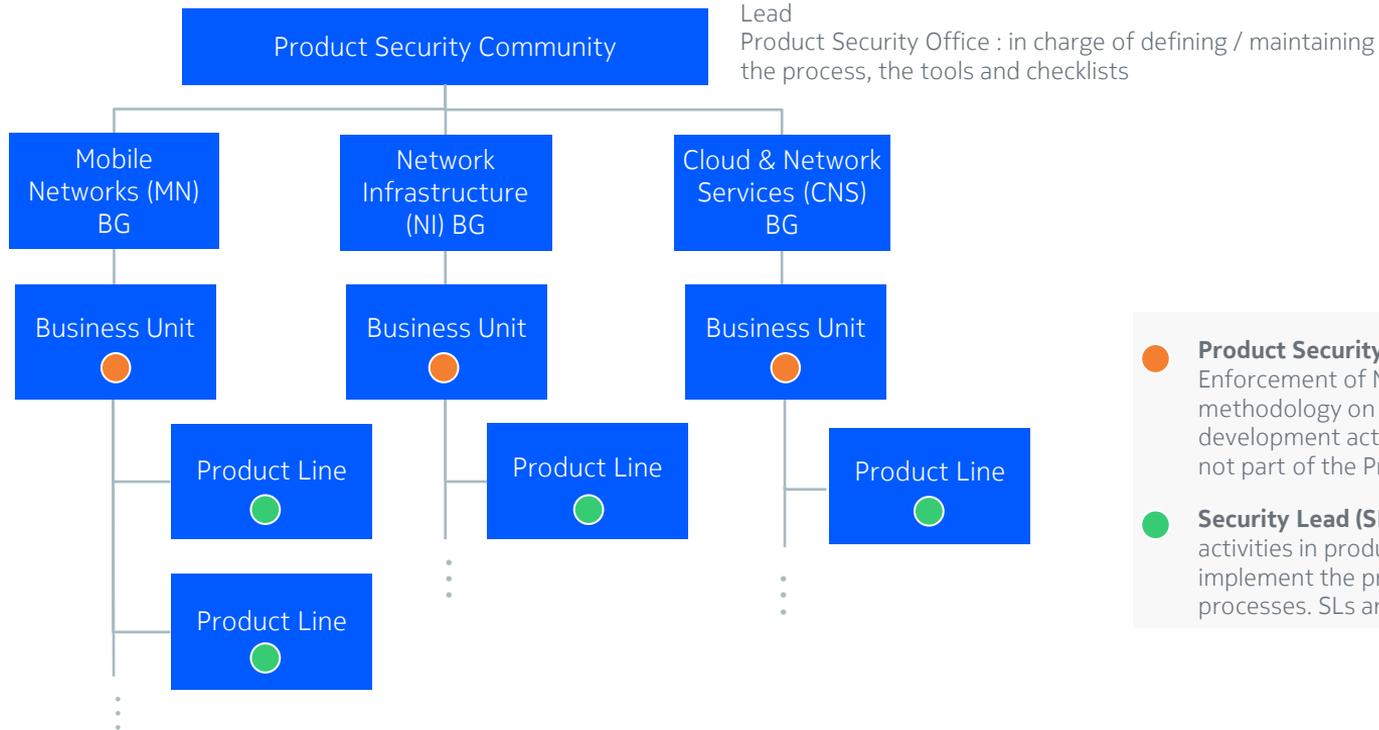
Fault management process

Vulnerability information from public sources



Design for Security process

Process supported by a virtual security organization inside Nokia



- **Product Security Manager (PSM):** Enforcement of Nokia's product security methodology on product and system development activities. PSMs are in the BGs, but not part of the Product Lines
- **Security Lead (SL):** Leader of product security activities in product lines that is responsible to implement the proactive and reactive security processes. SLs are in R&D of Product Lines.

Nokia Security & Privacy Management Process (DFSEC)

Nokia Networks Product Security Baseline

Product Privacy Baseline

Secure Coding
Guidelines

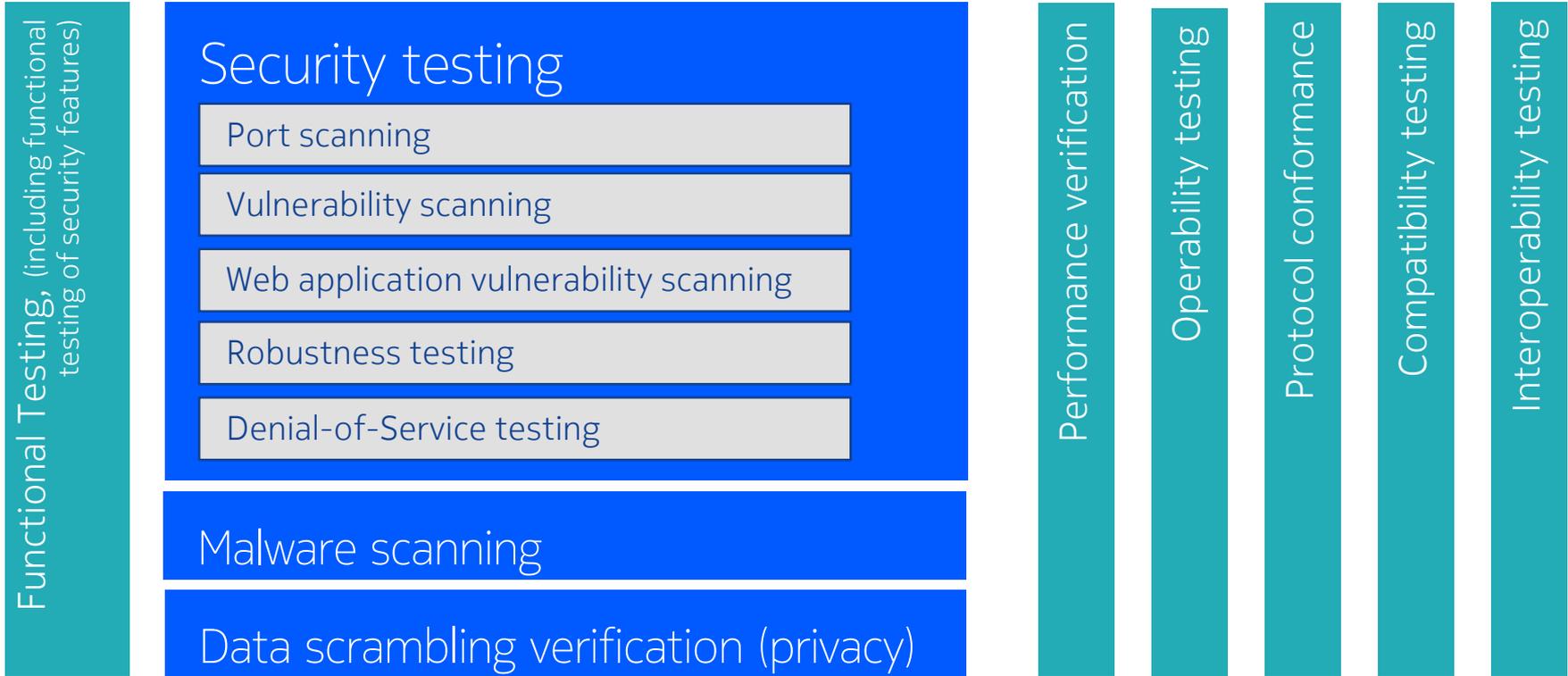
Hardening
Guideline

Security
Testing
Guideline

Crypto
Guideline

Privacy Engineering and
Assurance Process

Security & privacy testing as part of integration and verification



Security Statement of Compliance

DFSEC process compliance	DFSEC process: Ensures that DFSEC milestone deliverables are done and the DFSEC process followed
Security Testing	Security Testing: analyze the security exposure and to find vulnerabilities and robustness issues
Vulnerability Management	Vulnerability Management: to effectively handle relevant 3rd party vulnerabilities and ensure a release free of known high severity vulnerabilities
Hardening	Hardening: secure the system by removing unneeded functionality and configuring the remaining securely
Security Baseline	Security baseline: Industry-standard security best practices. Security Baseline ensures a low security exposure
Virtualization	Virtualization: Requirements for secure virtualized products
Privacy	Privacy: Requirements for privacy respecting products

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