



# Design for Security (DFSEC)

NOKIA

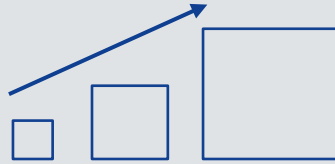
# Solutions for the Programmable World

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



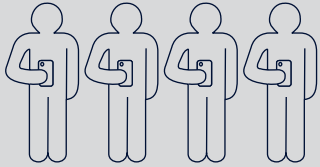
### Automated

through threat intelligence, efficient correlation, Continuous Integration.



# Nokia Design for Security

Customers



Standards



Regulations



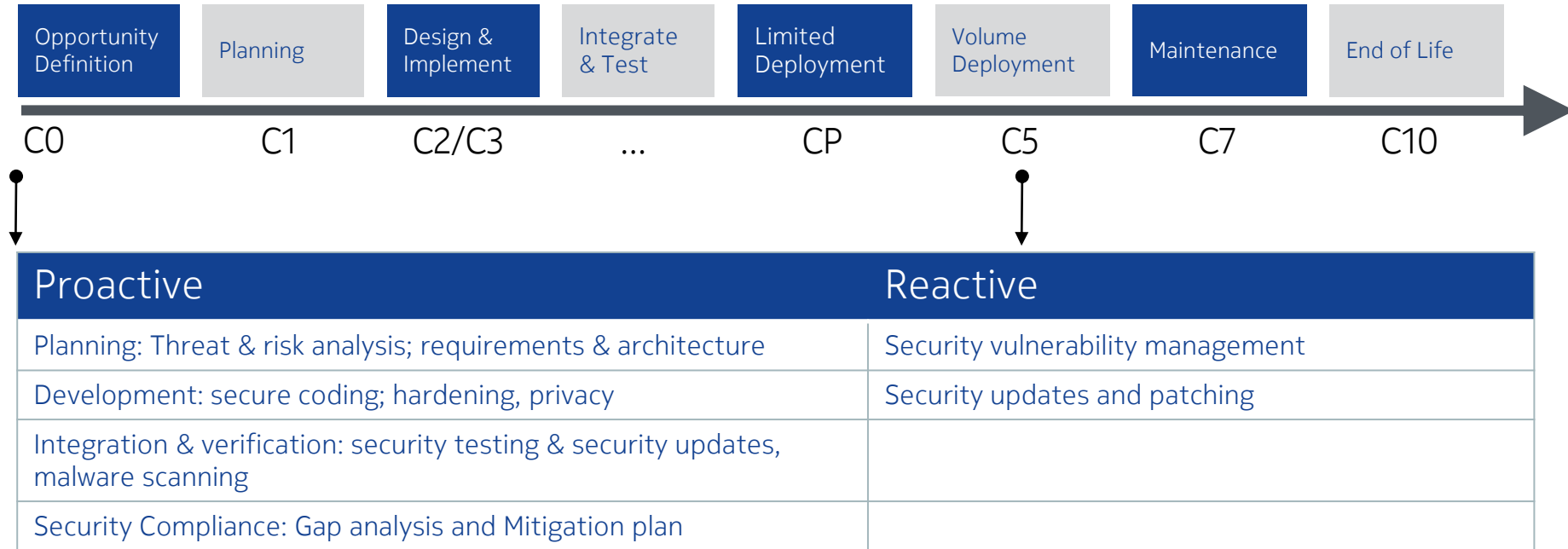
Emerging technologies



- 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

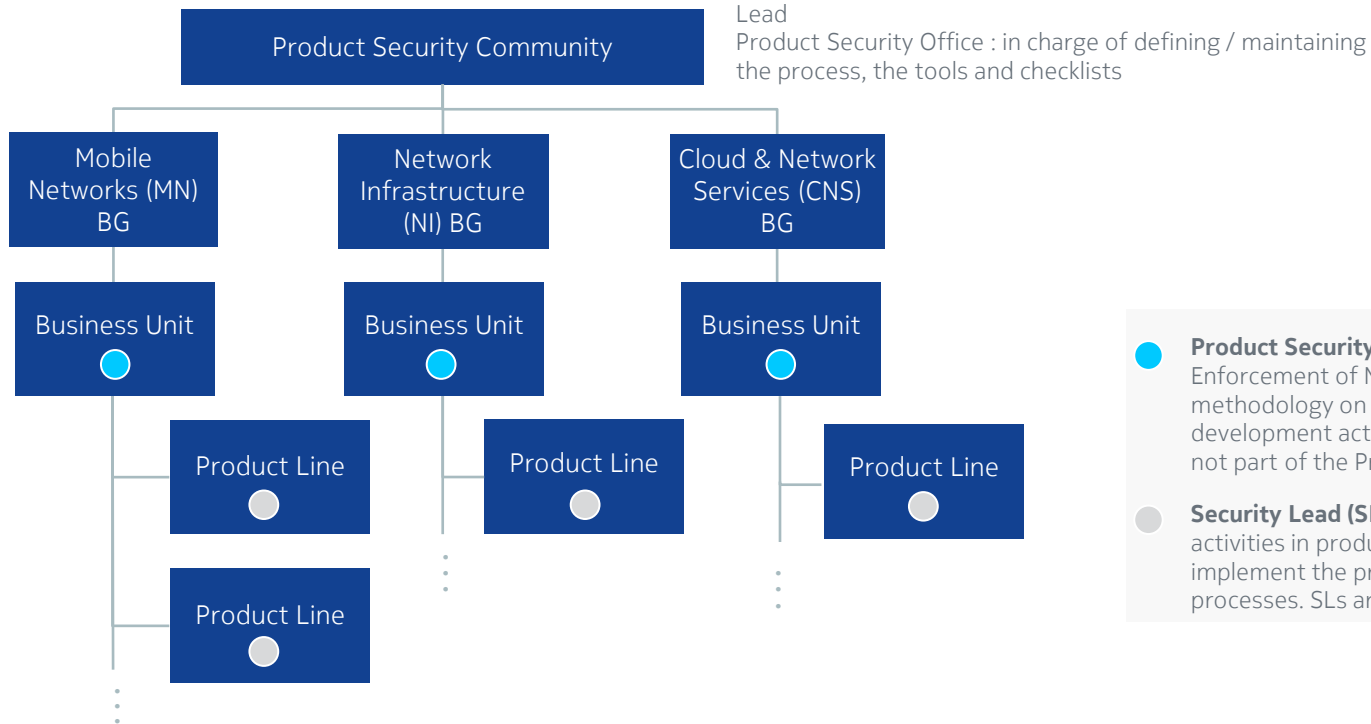
Fault management process

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

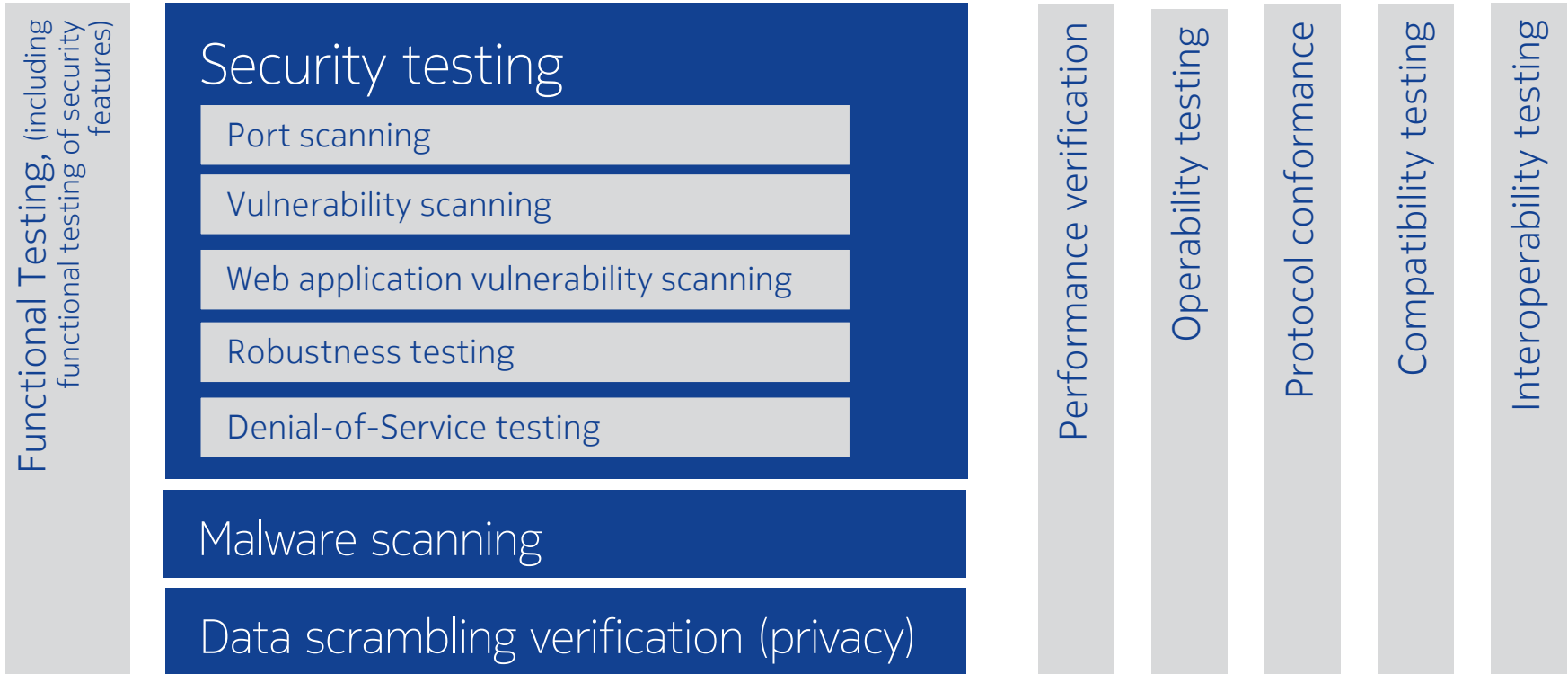
Hardening  
Guideline

Security  
Testing  
Guideline

Crypto  
Guideline

Privacy Engineering and  
Assurance Process

# Security & privacy testing as part of integration and verification





# Security Statement of Compliance

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

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