Security Testing for Compliance: Meeting Standards, Reducing Risk

DistriNet

A level of Quality or Attainment

Standard

Technology

V

- Road vehicles
- Payment cards
- Embedded systems
- Industrial Control systems
- Information systems
- Digital systems

H

Concern

- Interoperability
- Safety
- Security
- Privacy

Role

- Operators
- Integrators
- Manufacturers

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A level of Quality or Attainment

Standard

ISO/TR 4804

ISO/SAE 21434

Common Criteria

IEC 61508

IEC62443

EN 18031

ISO 27001

ETSI EN 303 645

NBN EN 17529:2022

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Road vehicles

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ISO 27001

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IEC61508

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Mandatory Quality or Attainment

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legislation

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legislation

Product requirements

RED-DA
(August 2025)

“make systems cyber secure”
(radio equipment)

Product Requirements + Product Lifecycle

CRA
(December 2027)

“make systems cyber resilient”
(digital systems)

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legislation

Standard

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Common Criteria

EN 18031

requirements

requirements + lifecycle

requirements + lifecycle

requirements

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- Authentication & access control
- Data protection
- No known vulnerabilities
- logging
- Secure updates
- Mitigate DoS attacks
- Control attack (surface)
- intervenience
- Network monitoring
- transparency

RED-DA
(August 2025)

Requirement	3.3.(d)	3.3.(e)	3.3.(f)
[ACM] Access control mechanism	✓	✓	✓
[AUM] Authentication mechanism	✓	✓	✓
[SUM] Secure update mechanism	✓	✓	✓
[SSM] Secure storage mechanism	✓	✓	✓
[SCM] Secure communication mechanism	✓	✓	✓
[LGM] Logging mechanism	-	✓	✓
[DLM] Deletion mechanism	-	✓	-
[UNM] User notificiation mechanism	-	✓	-
[RLM] Resilience mechanism	✓	-	-
[NMM] Network monitoring mechanism	✓	-	-
[TCM] Traffic control mechanism	✓	-	-
[CCK] Confidential cryptographic keys	✓	✓	✓
[GEC] General equipment capabilities	✓	✓	✓
[CRY] Cryptography	✓	✓	✓

EN 18031

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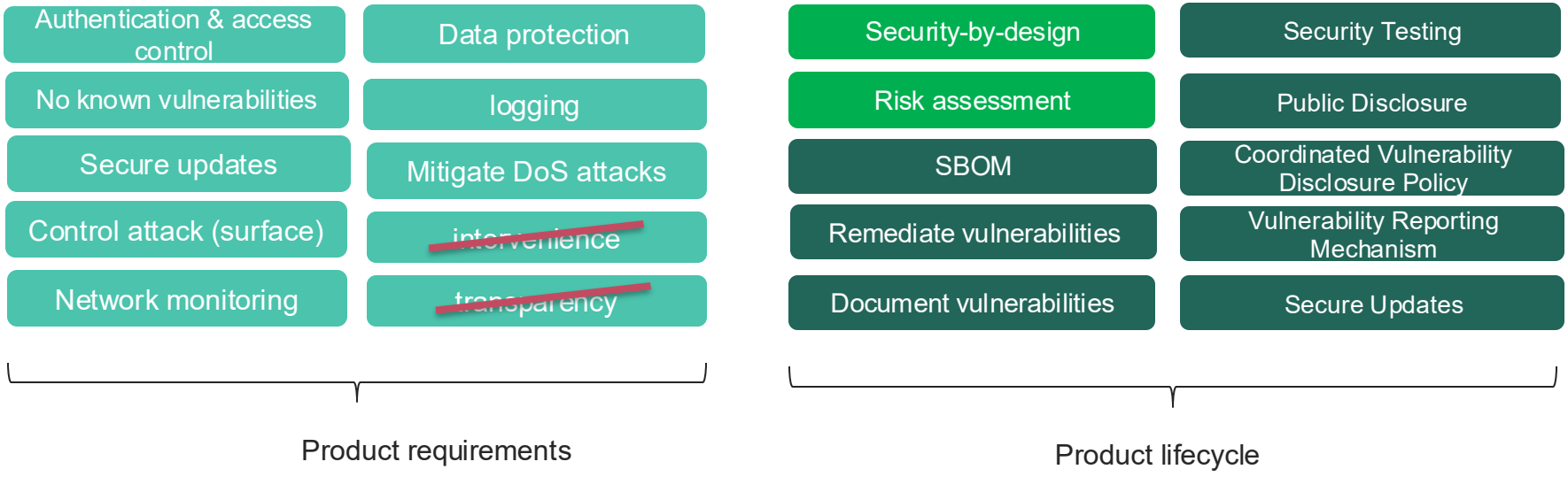
RED-DA
(August 2025)

“make systems cyber secure”

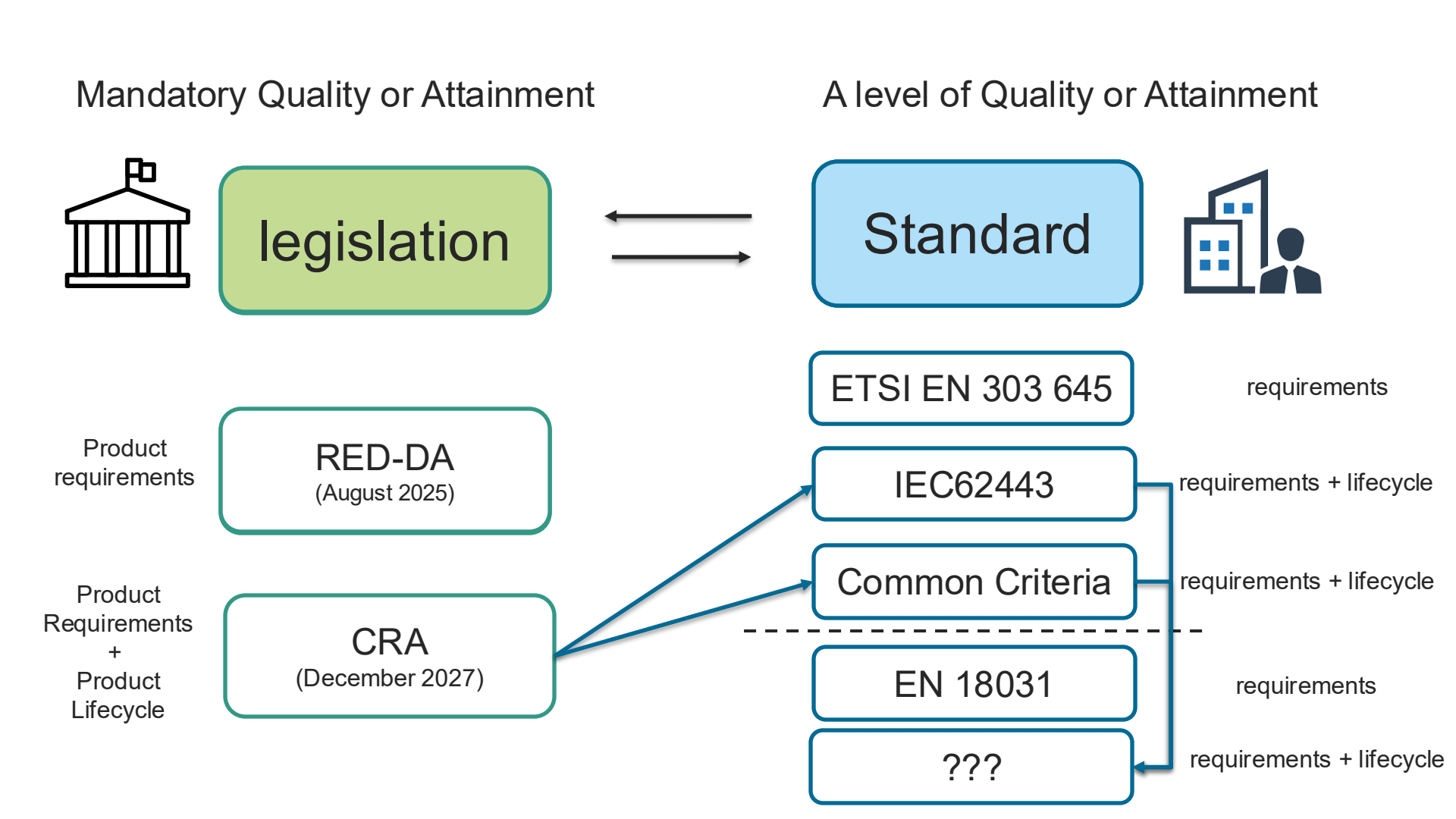
CRA
(December 2027)

“make systems cyber resilient”



CRA
(December 2027)

DistriNet


Mandatory Quality or Attainment
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???
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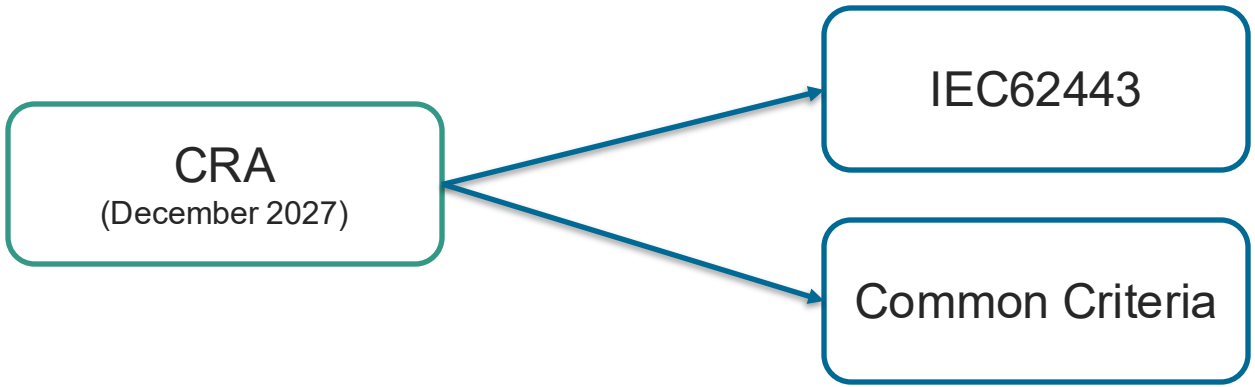
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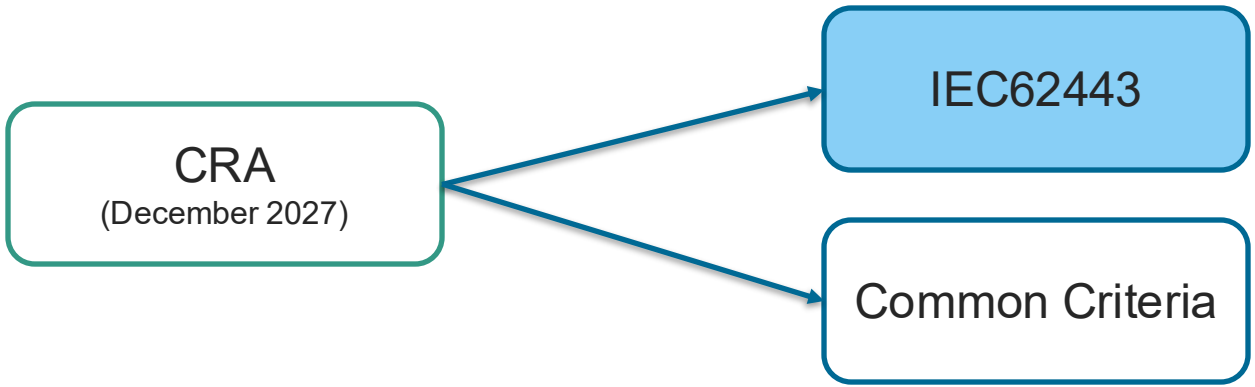
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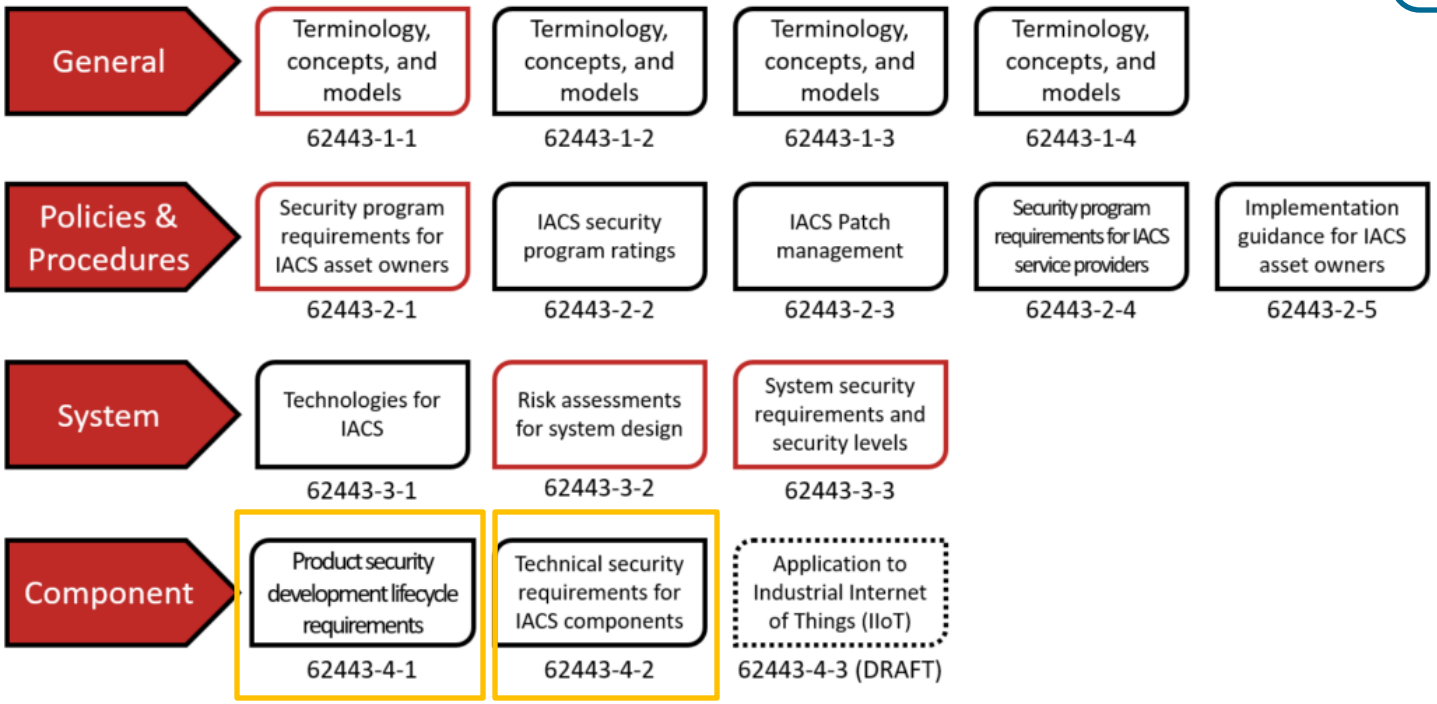

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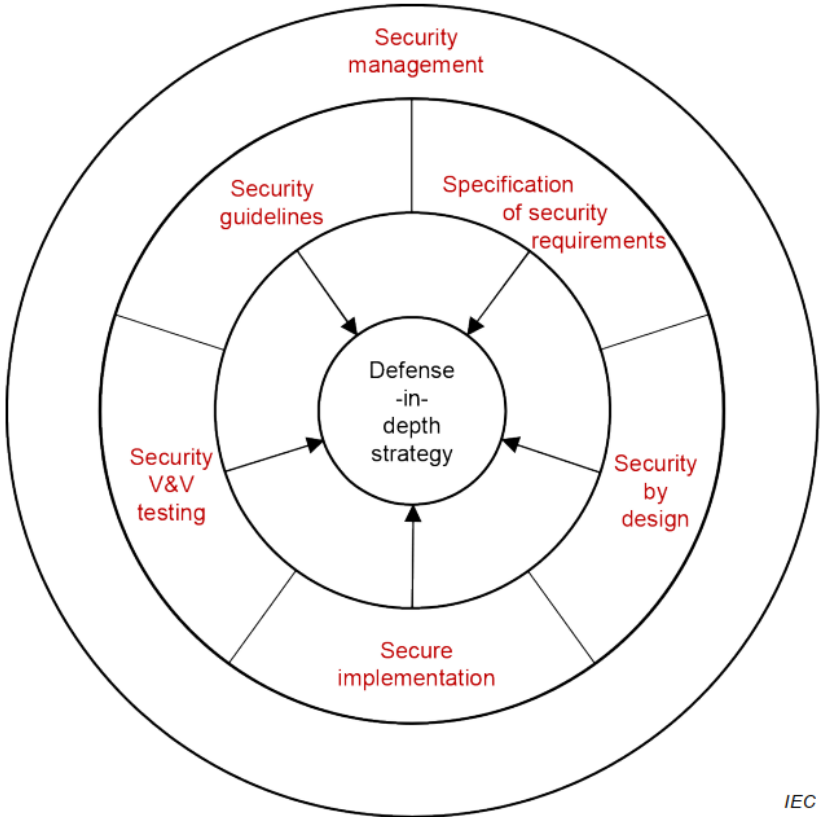
IEC62443-4-1: SDLC Requirements

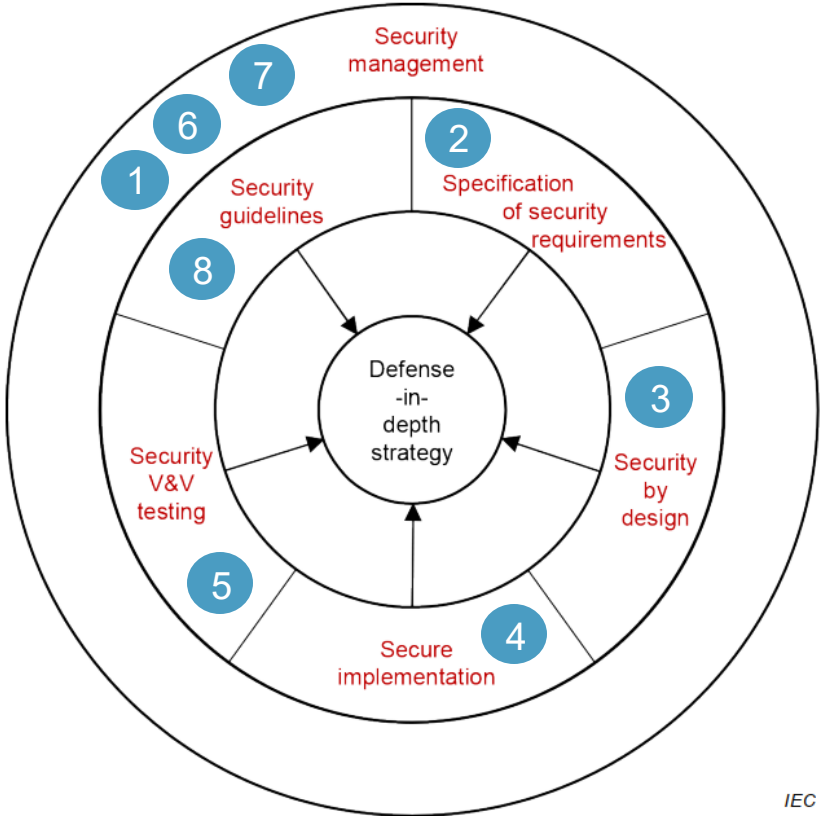
IEC62443



IEC62443-4-1: SDLC Requirements

IEC62443

1. *Security management*
2. Specification of security requirements
3. Security by design
4. Secure implementation
5. Security verification and validation
6. *Management of security-related issues*
7. *Security update management*
8. Security guidelines



IEC62443-4-1: SDLC Requirements

IEC62443

1. *Security management*
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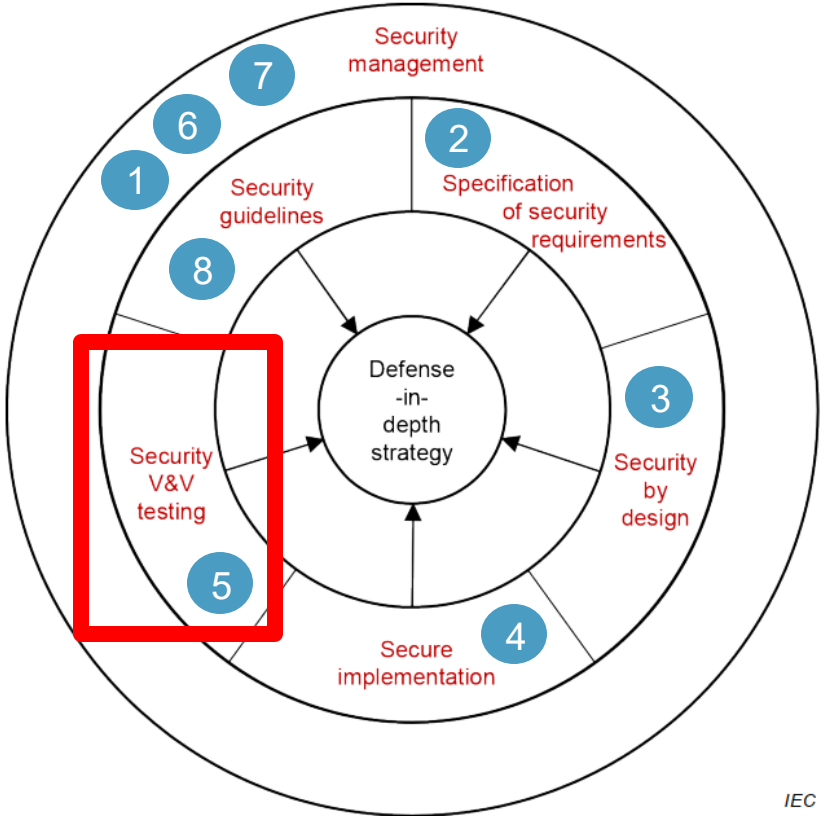


IEC62443-4-1 – practice 5: Security verification and validation testing

- **SVV-1: Security requirements testing**
  - Functional testing of security requirements
  - Performance and scalability testing
- **SVV-2: Threat mitigation testing**
  - Test effectiveness of mitigations to threats identified by the threat model (STRIDE)
  - If a layered defense strategy is used, then test the effectiveness of each layer

Do security measures work?

- **SVV-3: Vulnerability Testing**
  - Base known vulnerability testing on public source for known vulnerabilities
  - Attack surface analysis, (un)known vulnerability scanning (fuzzing, stress testing…)
- **SVV-4: Penetration Testing**
  - Approach testing like an attacker
  - Often involves exploiting chained vulnerabilities in a product

Any code Vulnerabilities?

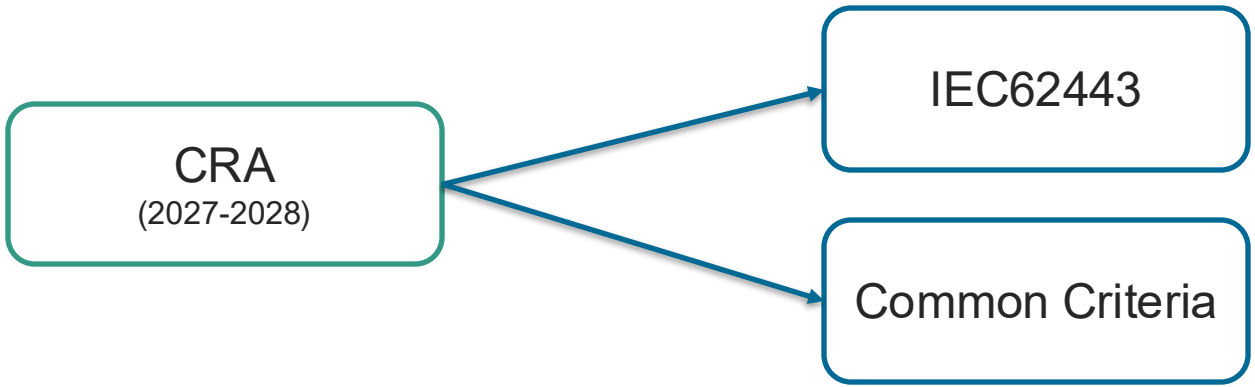
IEC62443-4-1 – practice 5: Security V&V testing

IEC62443

Table 3 – Required level of independence of testers from developers

Test type	Reference	Level of independence
Security requirements testing	SVV-1 – Security requirements testing	Independent department
Threat mitigation testing	SVV-2 – Threat mitigation testing	Independent department
Abuse case testing	SVV-3 – Vulnerability testing	Independent person
Static code analysis	SI-1 – Security implementation review	None
Attack surface analysis	SVV-3 – Vulnerability testing	Independent person
Known vulnerability scanning	SVV-3 – Vulnerability testing	Independent person
Software composition analysis	SVV-3 – Vulnerability testing	None
Penetration testing	SVV-4 – Penetration testing	Independent department or organization

Who should perform tests?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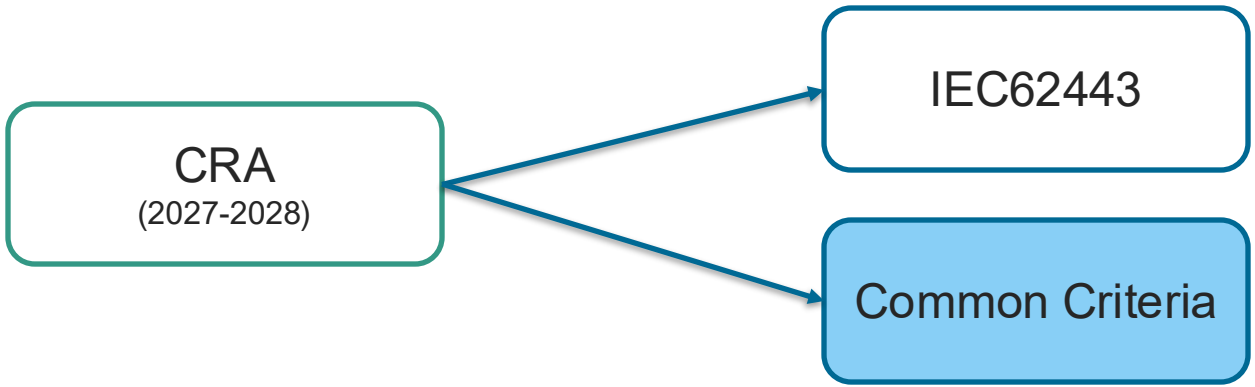
Common Criteria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(2027-2028)
IEC62443
Common Criteria

Common Criteria for IT Security Evaluation

ISO/IEC 15408

Common Criteria

- a **framework** in which computer system **users** can specify their security **functional requirements (SFRs) and assurance requirements (SARs)** in a **Security Target** (ST), and may be taken from **Protection Profiles** (PPs)

- **Vendors** can then *implement* or **make claims about the security attributes of their products**, and testing laboratories can *evaluate* the products

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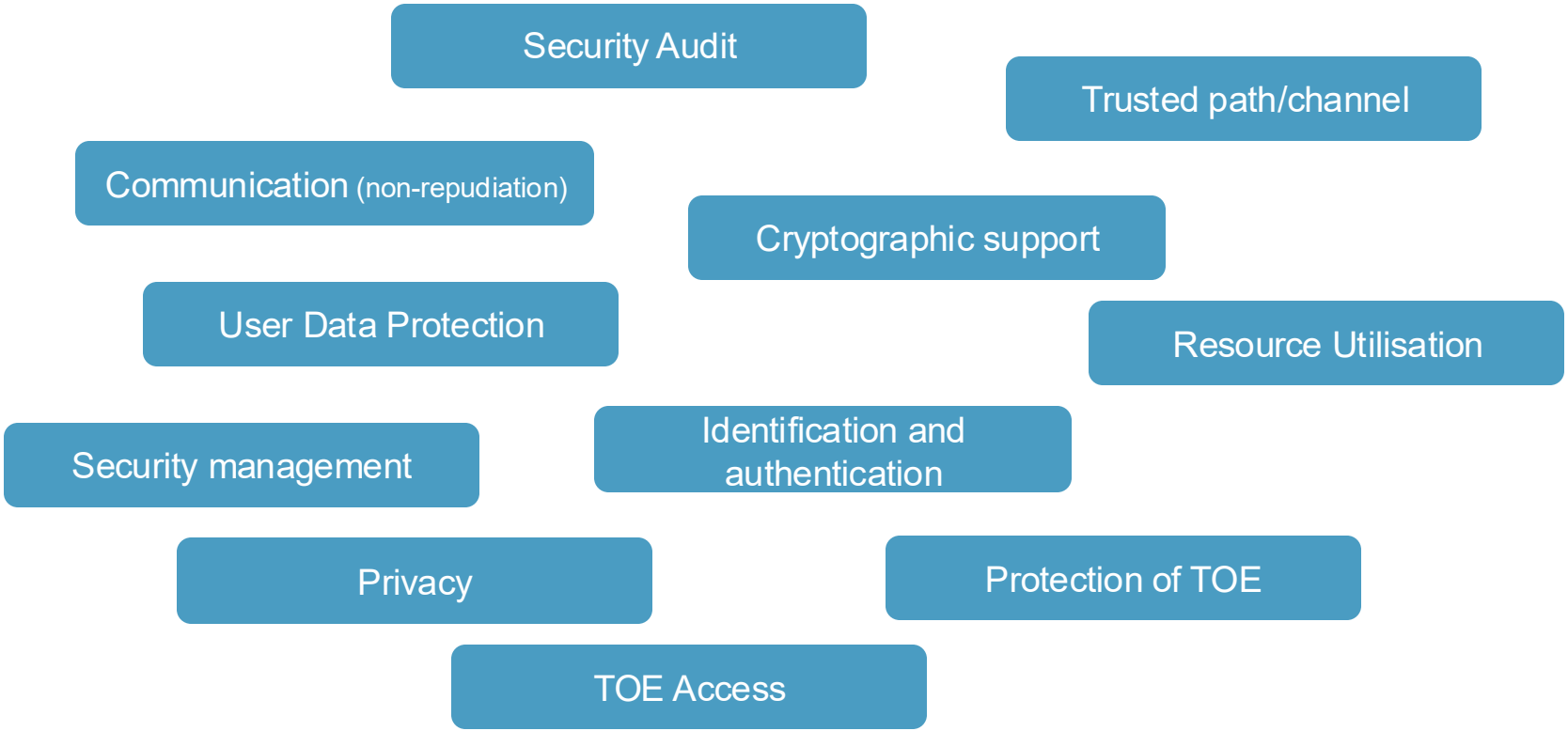
Security Functional Requirement (SFR) Classes

Common Criteria



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Security Assurance Requirement (SAR) Classes

Common Criteria

Protection Profile Configuration evaluation

Life-cycle support

Protection Profile evaluation

Tests

Class AGD: Guidance documents

Security Target evaluation

Composition

Development

Vulnerability assessment

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Security Assurance Requirement (SAR) Classes

Common Criteria

Protection Profile Configuration evaluation

Life-cycle support

Protection Profile evaluation

Tests

Class AGD: Guidance documents

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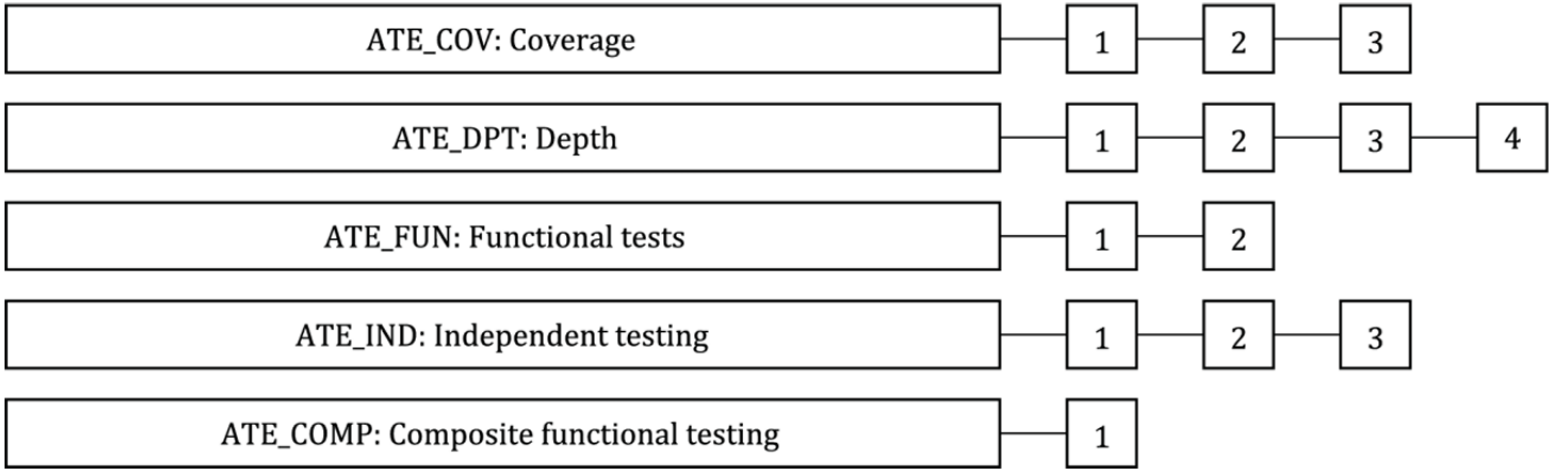
Security Assurance Requirement Class Tests

Common Criteria

- Focus on confirmation that the TSF operates according to its design descriptions
- This class does not address penetration testing
- Tests performed by developer and evaluator



Do security measures work?

Who should perform tests?

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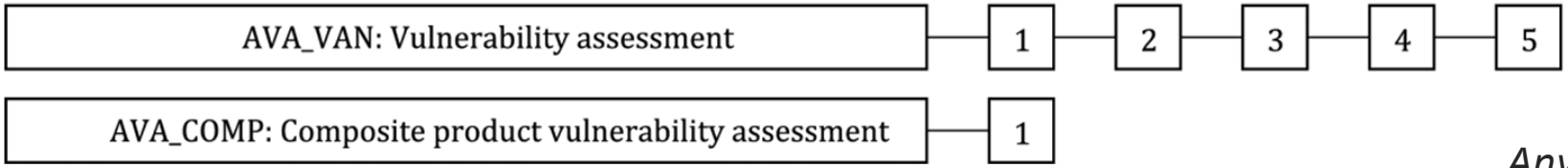
SAR Class Vulnerability Assessment

Common Criteria

- addresses the possibility of exploitable vulnerabilities introduced in the development or the operation of the security target



Any code Vulnerabilities?

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Conclusions

Mandatory Quality or Attainment

A level of Quality or Attainment

legislation

Standard

Certification

Evaluating the Quality or Attainment

Mandatory Quality or Attainment

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