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Product Security Certifications

Who, What, Where, and Why

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Background

- Formal security certification of products is not new
- Many governments require certification of products
  - Typically, those used in government systems
  - Occasionally, a market sector (e.g., HIPAA for healthcare in the US)

- For vendors, a certification can help meet minimum requirements or result in preferential treatment

Changing Landscape

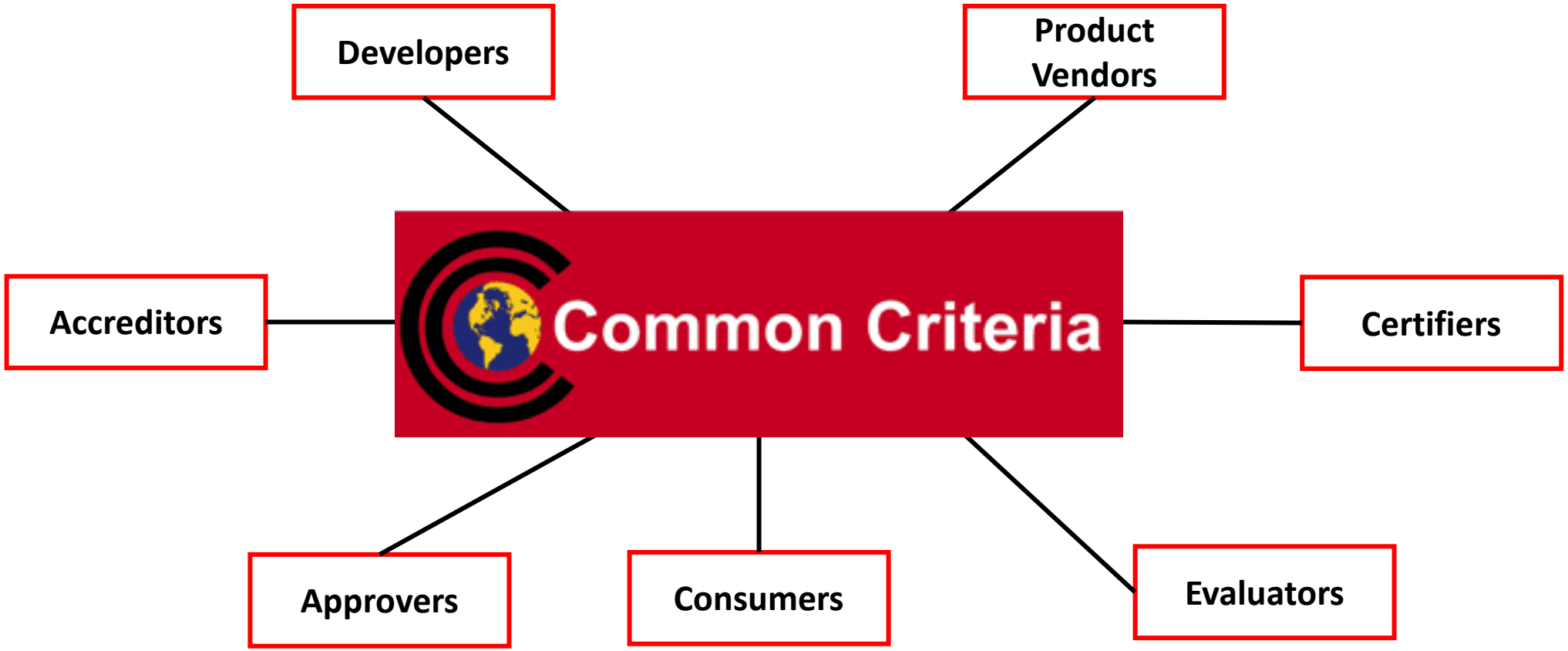
- The continued onslaught of data breaches and other attacks is raising the stakes for everyone
- Supply chain security issues are causing major headaches
- The legal community and regulators are holding suppliers accountable

- Two key certification programs have been updated:
  - Cryptographic Module Validation Program (CMVP) only accepting FIPS 140-3 submissions as of 2022-04-01
  - Common Criteria is being updated with the publication of the ISO/IEC 15408:2022 and ISO/IEC 18045:2022 standards

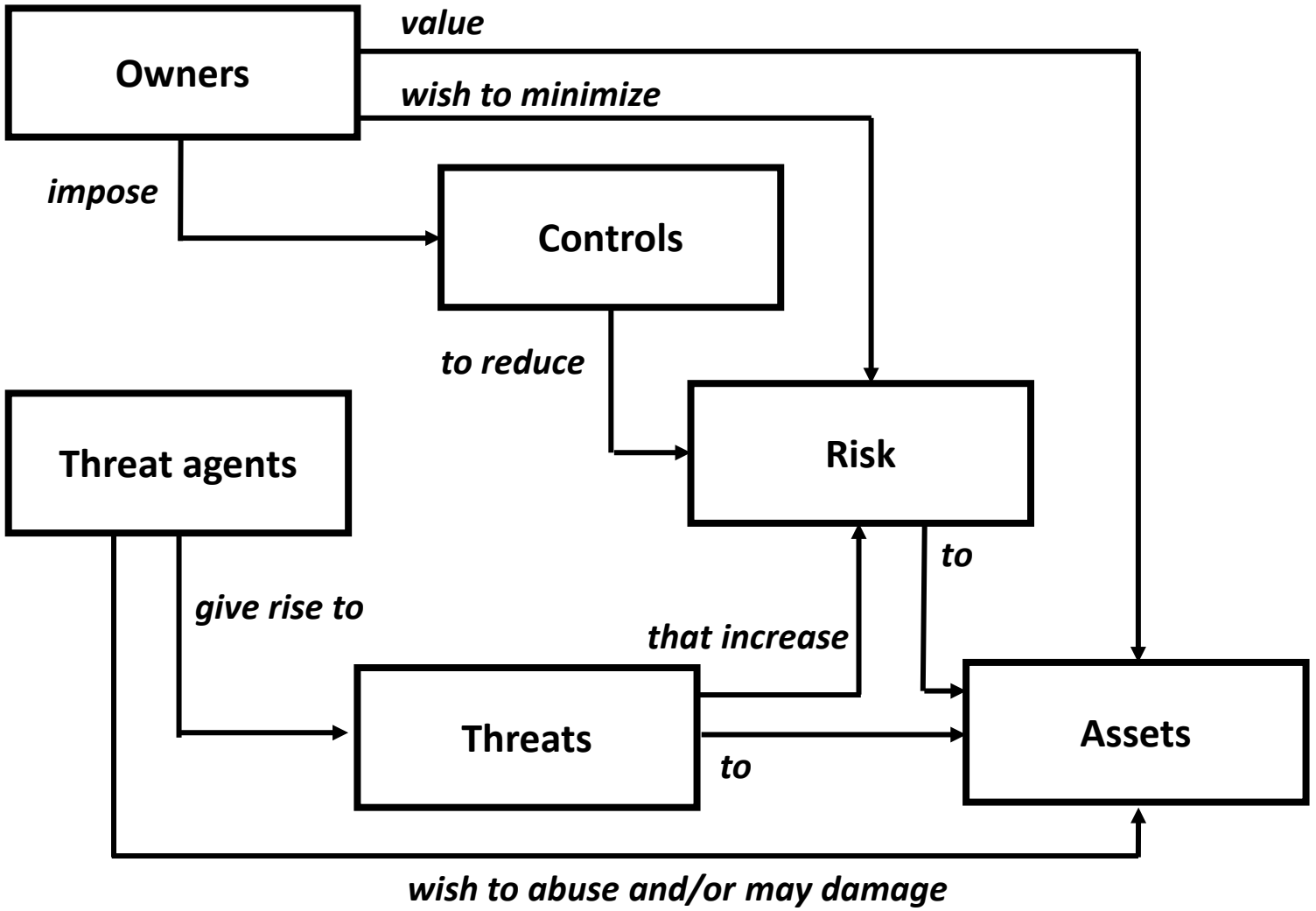
Common Criteria and FIPS 140-3

High-level Overview

Common Criteria (CC)

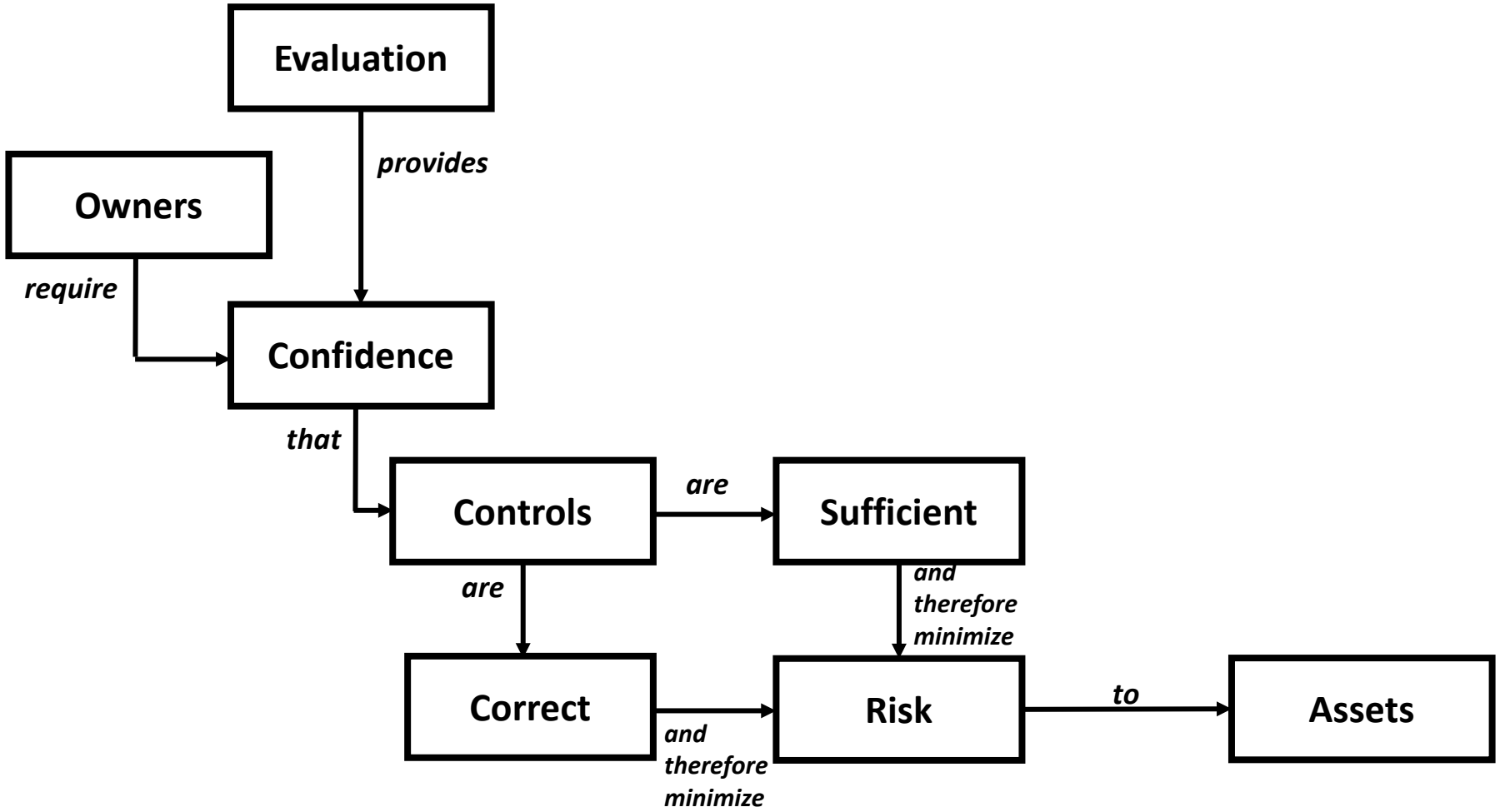


CC Security Concepts and Relationships



Source: ISO/IEC 5408-1:2022

CC Evaluation Concepts and Relationships

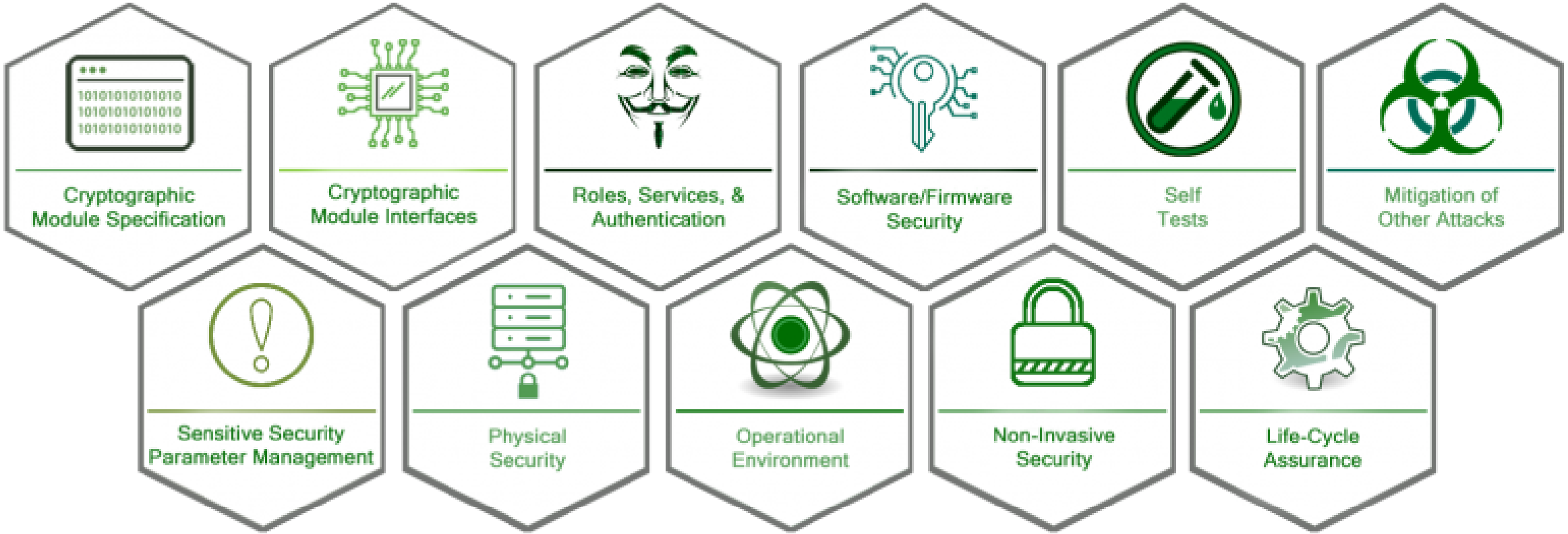


Source: ISO/IEC 5408-1:2022

CC Summary

- Certification is based on the entire product (target of evaluation)
  - Specific make and model as well as firmware
- Environment the product operates in can be a factor
- Vendors typically make their own security claims (basis of cert)
  - Evaluation assurance level (EAL) can impact requirements
- Protection Profiles (PP) and/or Collaborative Protection Profiles (cPP) may add an implementation-independent set of security requirements to also be considered
- Evaluation/testing performed by third-party (accredited lab)
- Results provided to CC scheme owner, which issues the cert
  - CC Mutual Recognition Agreement may help internationally
- Product changes can necessitate a recertification

FIPS 140-3 Elements



Source: Corsec Security, Inc.

FIPS 140-3 Summary

- Certification can be at the product level or limited to a subset (i.e., the cryptographic module)
- The security requirements are explicit
- Evaluation/testing performed by third-party (accredited lab)
- Results provided to scheme owner (NIST/CSEC), which issues the cert
- Product changes can necessitate a recertification

- Based on the ISO/IEC 19790:2012 requirements standard and ISO/IEC 24759:2017 derived test methods; US and CA use different criteria

Important Considerations

Product Development with an Eye to Certification

- System security engineering practices can be important
- Past vulnerability reports can be considered by the lab
- Documentation is important; CC and FIPS 140 are paper tigers
- Stated assumptions (e.g., the network is not a threat) have to pass the security giggle test
- Testing is critical to the third-party evaluation, so understand the testability of the security claims

Certification May Become Mandatory

- With the primary exception of encryption of sensitive US/CA Government data, certifications are currently optional for vendors
- Several governments and regions (EU) are considering mandatory security certifications as a condition of sales/use in their jurisdictions
- States are requiring “reasonable” security and considering ways to validate product security

Other Security Certifications

ISO/IEC 27001

- Organizational certification that focuses on information security management systems (ISMS)
- ISO/IEC 27002 controls are often used during the audits
- Vendors that have an ISO/IEC 27001 certification often get relief when being established as a qualified vendor (risk questionnaires)
- Products cannot be ISO/IEC 27001 certified

Payment Card Industry

- PCI Data Security Standard (PCI DSS) forms the basic requirements
- Required of organizations processing/handling credit card data
- Applies to the ICT involved with credit card data
- Products cannot be PCI DSS, but their inclusion or absence of security features can have an impact
- PCI DSS 4.0 was released early in 2022

Summary

Conclusions

- If security certifications are likely for a product, it is important to identify the strategy early in the product development
- The product security certification requirements could change significantly
  - New editions of standards and requirements
  - Possible mandatory certifications
- Because of the make/model nature of certifications, the timing should be carefully considered
- There may be opportunities for vendors to participate in the development of requirements (e.g., cPPs)

Recommendations Before Signing a Lab

- Vet the accredited lab prior to engaging
  - Do you need to develop test harness or use your own resources?
- Check the pricing contingency the lab is building into their testing model
  - If retesting is necessary, this presents risk to the lab
- Determine how the lab does its gap analysis
  - Paper-based approaches can miss granular details
- Confirm with the lab how long the entire process takes
- Determine ownership of the project deliverables

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