Security Goals

Information Security (44 U.S. Code § 3542)

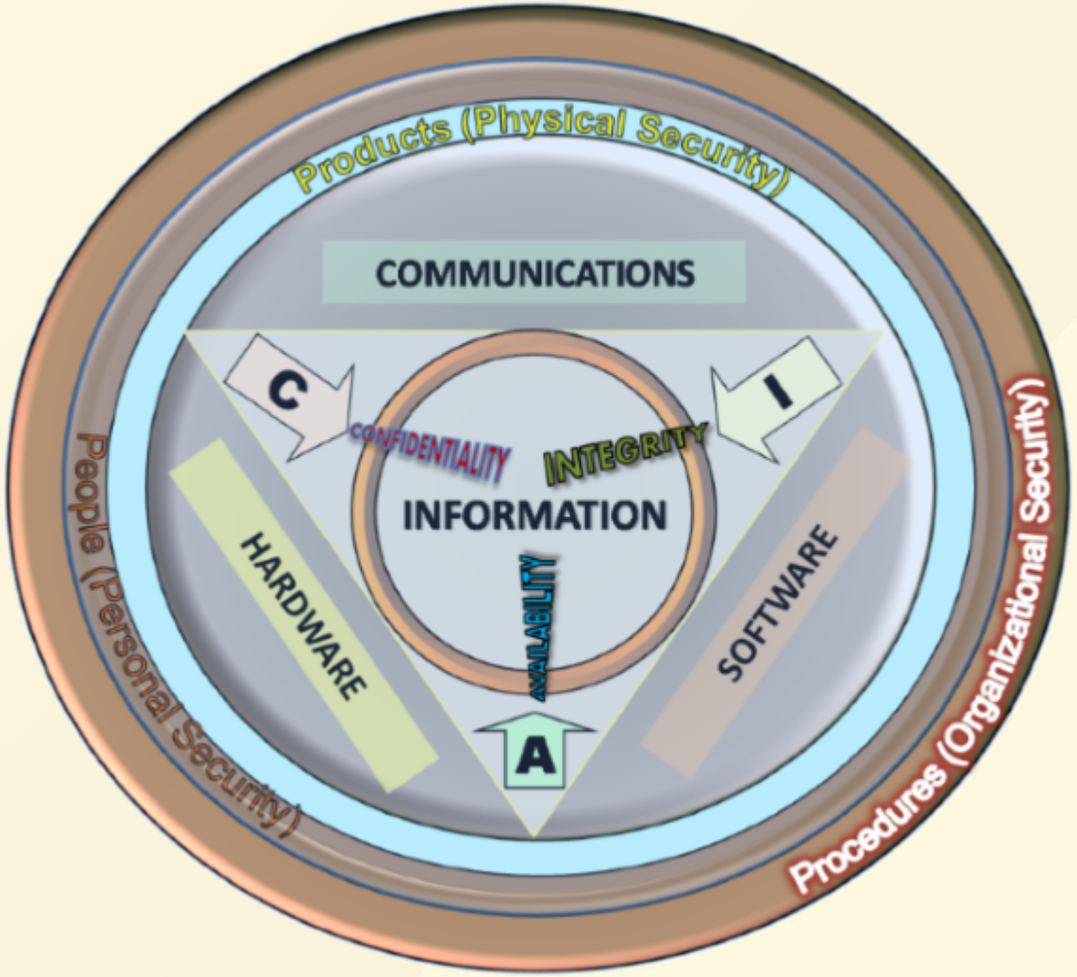
“ (1) The term “information security” means protecting information and information systems from unauthorized access, use, disclosure, disruption, modification, or destruction in order to provide—

(A) integrity, which means guarding against improper information modification or destruction, and includes ensuring information nonrepudiation and authenticity;

(B) confidentiality, which means preserving authorized restrictions on access and disclosure, including means for protecting personal privacy and proprietary information; and

(C) availability, which means ensuring timely and reliable access to and use of information. ”

Information Security Triad: CIA



🎯 Confidentiality

- **Protecting information from disclosure** to unauthorized parties
- Access to information should be granted only on a **need-to-know basis**
- **Data categorization** according to the amount and type of possible damage should it fall into wrong hands

Supporting Principles (🔐)

- Authentication, Authorization, Encryption, Anonymity, Secrecy

🎯 Integrity

- **Protecting information from being modified** by unauthorized parties
- Being correct or **consistent with the intended state** of information
- Ensuring that the **information is not tampered** whenever it travels from source to destination or even stored at rest

Supporting Principles (🔏)

- Hashing, Digital Signatures, Non-repudiation, Tamper-evident packaging

🎯 Availability

- Ensuring that authorized parties are **able to access information** when needed
- Ensuring that the services of an organization are available

Supporting Principles (🏧)

- Accessibility, Fault Tolerance, Redundancy, Backup, Testing

Exercise 2.1

1. Which security goals are at risk by the following threats?

Threat	C	I	A
Network Sniffing			
DDoS Attack			
Rogue WiFi Access Point			
Electromagnetic Pulse (EMP)			
Whistleblower			
Social Engineering			

Parkerian Hexad (1998)

- Confidentiality
- Possession / Control (🆕)
- Integrity
- Authenticity (🆕)
- Availability
- Utility (🆕)

🎯 Possession / Control

- Protecting against the idea that **confidential data can be possessed/controlled by an unauthorized individual or party**
- Loss of control or possession of information should not automatically lead to the breach of confidentiality

Supporting Principles (🧳)

- Encryption, Authentication

🎯 Authenticity

- Assurance that **a message or transaction is from the source it claims to be from**

Supporting Principles (📝)

- Identification, Digital Certificates

🎯 Utility

- **Usefulness** of data or information

Supporting Principles (💾📟)

- Compatibility, Accessibility

> Information may be available and therefore usable but it doesn't necessarily have to be in a useful form to be defined as available. [^1]

CIA³ (2016)

- Confidentiality
- Integrity
- Availability
- Accountability (NEW)
- Assurance (NEW)

🎯 Accountability

- Allowing to answer questions like *"Who did it?"* or *"Who is accountable?"*
- Considering **legal consequences** and contractual obligations
- Encompassing **segregation of duties** and awareness training

Supporting Principles (🙈🙉🙊)

- **Integrity**, Non-repudiation, Authenticity, Design, Governance, Policy

🎯 Assurance

- Introduces **control activities** for the aforementioned security goals
- Periodic controls **assuring that all security measures** (both technical and operational) **work as intended**

Supporting Principles (📊 📈)

- Auditing, Measuring, Monitoring, Continuous Improvement

Dependency Model of CIA³

Exercise 2.2 (📌)

1. Define at least three supporting measures for each CIA³ security goal, distinguishing between technical and organizational measures

Security Goal	Technical Measures	Organizational Measures
Confidentiality		
Integrity		
Availability		
Accountability		
Assurance		