

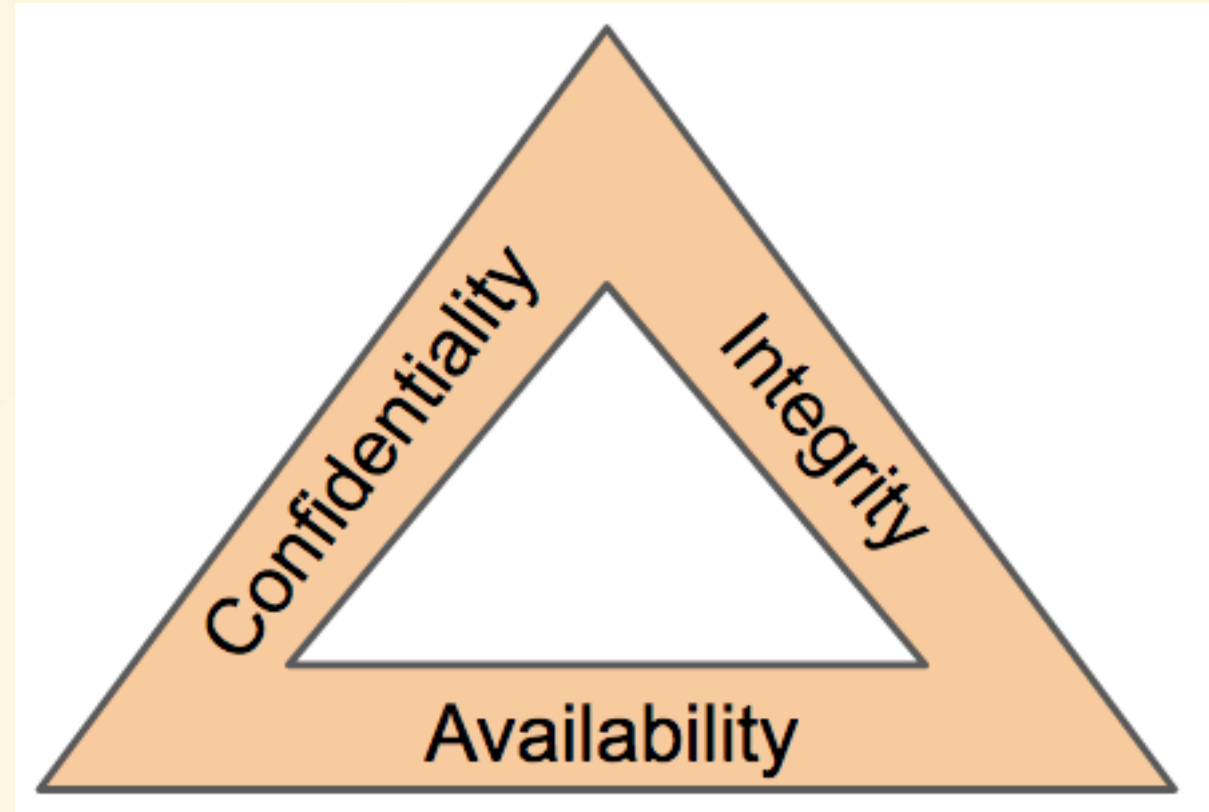
Cybersecurity Basics

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Security

Security is about properties.

- Confidentiality
- Integrity
- Availability



Confidentiality

Assets are accessed only by authorized parties.

- often referred to as privacy or secrecy.

Integrity

Assents can be modified only by authorized parties.



Availability

- Assets are accessible to authorized parties at appropriate times



Terminology

- Vulnerability
 - A weakness in the security system that might be exploited to cause loss or harm.
- Threat
 - A set of circumstances that has the potential to cause loss or harm.
- Attack
 - The execution of a plan to carry out a threat by exploiting a vulnerability.

Security Implications

- Responses
 - Vulnerability prevention and detection.
 - Threat assessment.
 - Attack/Intrusion prevention, detection, and mitigation.
 - Challenge: Possible evasions.

Fundamental Security Design Principles

- Economy of Mechanism
- Fail-safe Defaults
- Complete Mediation
- Open Design
- Separation of Privilege
- Least Privilege

Fundamental Security Design Principles

- Least Common Mechanism
- Psychological Acceptability (Usability)
- Isolation
- Encapsulation
- Modularity
- Layering (Defense in Depth)

Fundamental Security Design Principles

- Minimize Trust Surface
- Trust Relationships