Security Engineering

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What is "Security Engineering"?

- Security engineering is about building systems to remain dependable in the face of malice, error and mischance.

- As a discipline, it focuses on the tools, processes and methods needed to design, implement and test complete systems, and to adapt existing systems as their environment evolves.

Security vs Reliability

- Reliability and security are often strongly correlated in practice

  - But malice is different from error!

  - Reliability: "Bob will be able to read this file"

  - Security: "The Chinese Government won't be able to read this file"

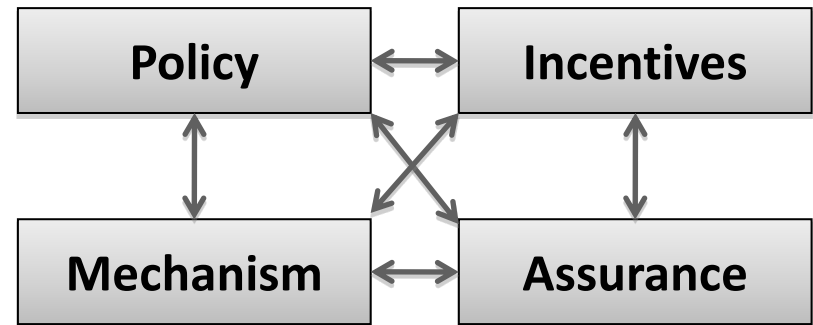- Proving a negative (security) can be much harder …

Framework for security

1. **Policy**: what you are supposed to achieve

2. **Mechanism**: ciphers, access control, hardware tamper resistance to implement the policy

3. **Assurance**: the amount of reliance you can put on each mechanism

4. **Incentive**: the motive for the people guarding the system

Questions?