Network Security

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Outline

- Attacks, services and mechanisms
- Security attacks
- Security services
- Methods of Defense
- A model for Internetwork Security
- Internet standards and RFCs

Attacks, Services and Mechanisms

- **Security Attack:** Any action that compromises the security of information.

- **Security Mechanism:** A mechanism that is designed to detect, prevent, or recover from a security attack.

- **Security Service:** A service that enhances the security of data processing systems and information transfers. A security service makes use of one or more security mechanisms.
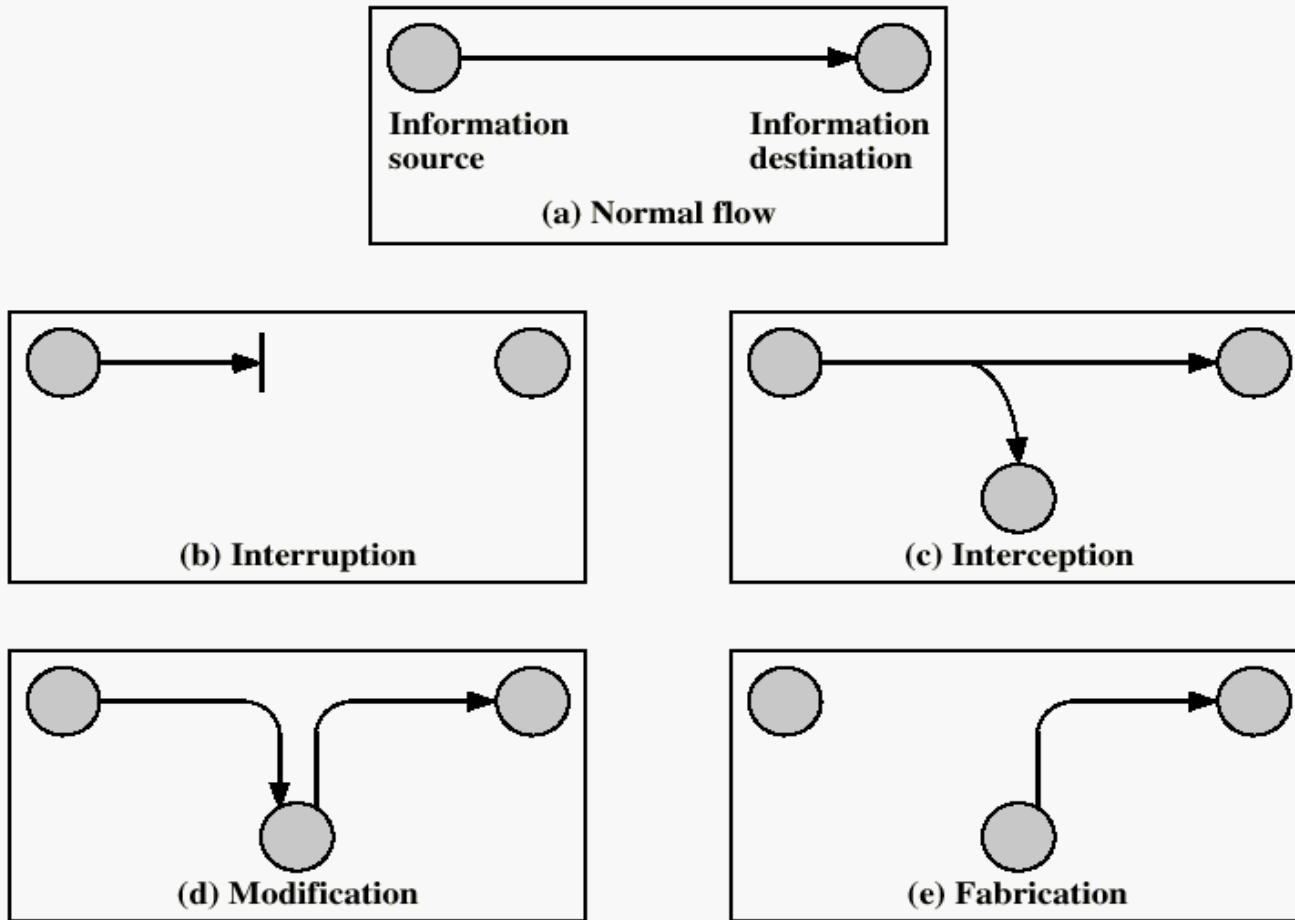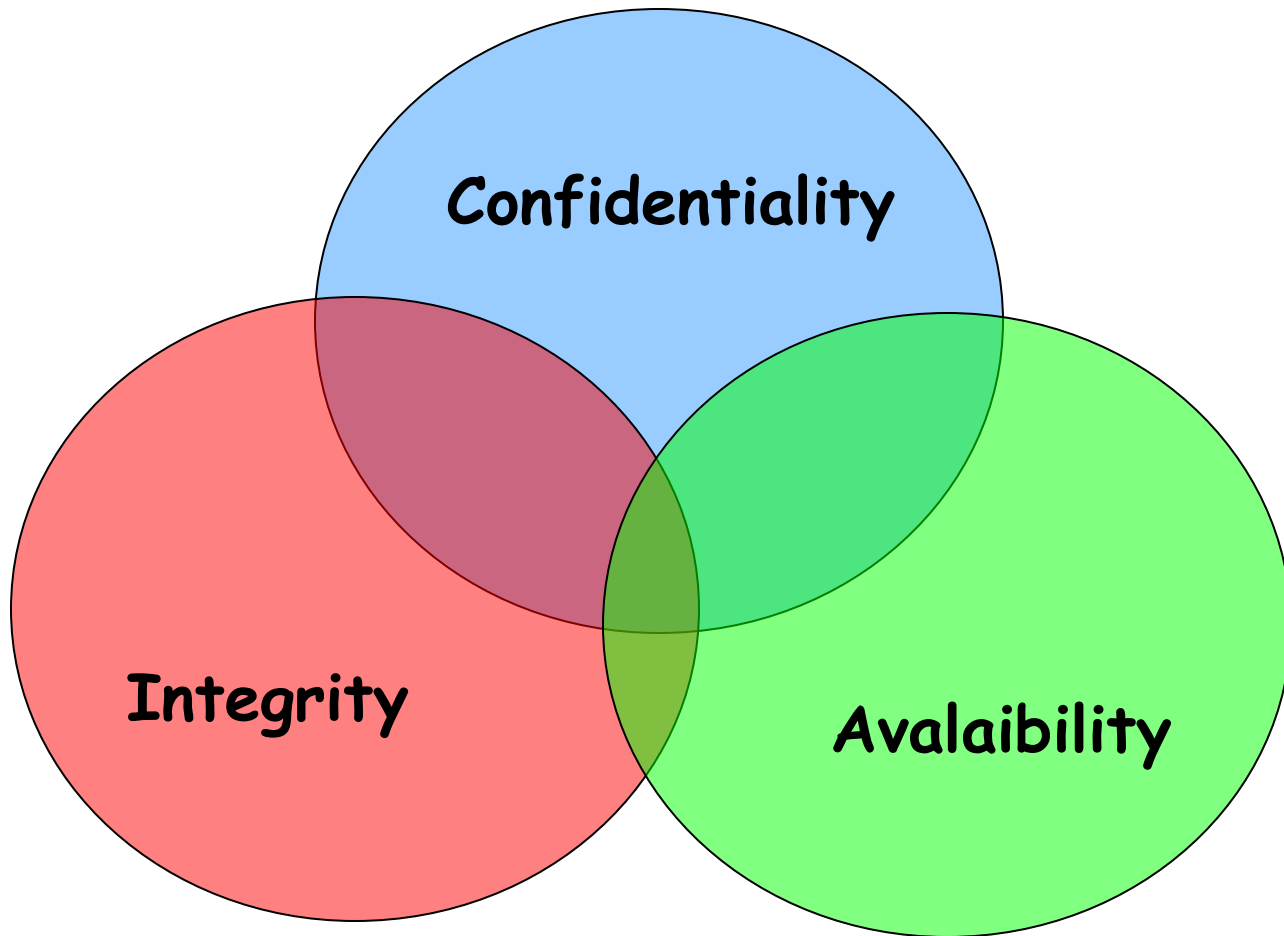
Security Attacks

Figure 1.1   Security Threats

Security Attacks

- **Interruption**: This is an attack on availability
- **Interception**: This is an attack on confidentiality
- **Modification**: This is an attack on integrity
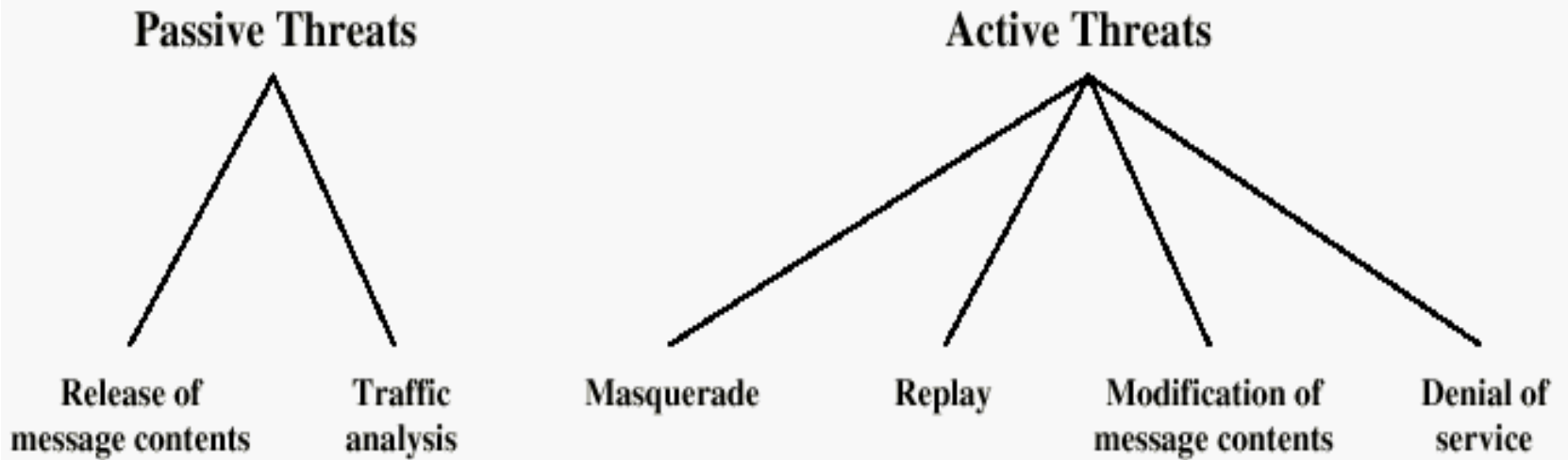- **Fabrication**: This is an attack on authenticity

Security Goals

Figure 1.2 Active and Passive Security Threats

Security Services

- Confidentiality (privacy)

- Authentication (who created or sent the data)

- Integrity (has not been altered)

- Non-repudiation (the order is final)

- Access control (prevent misuse of resources)

- Availability (permanence, non-erasure)

  - Denial of Service Attacks
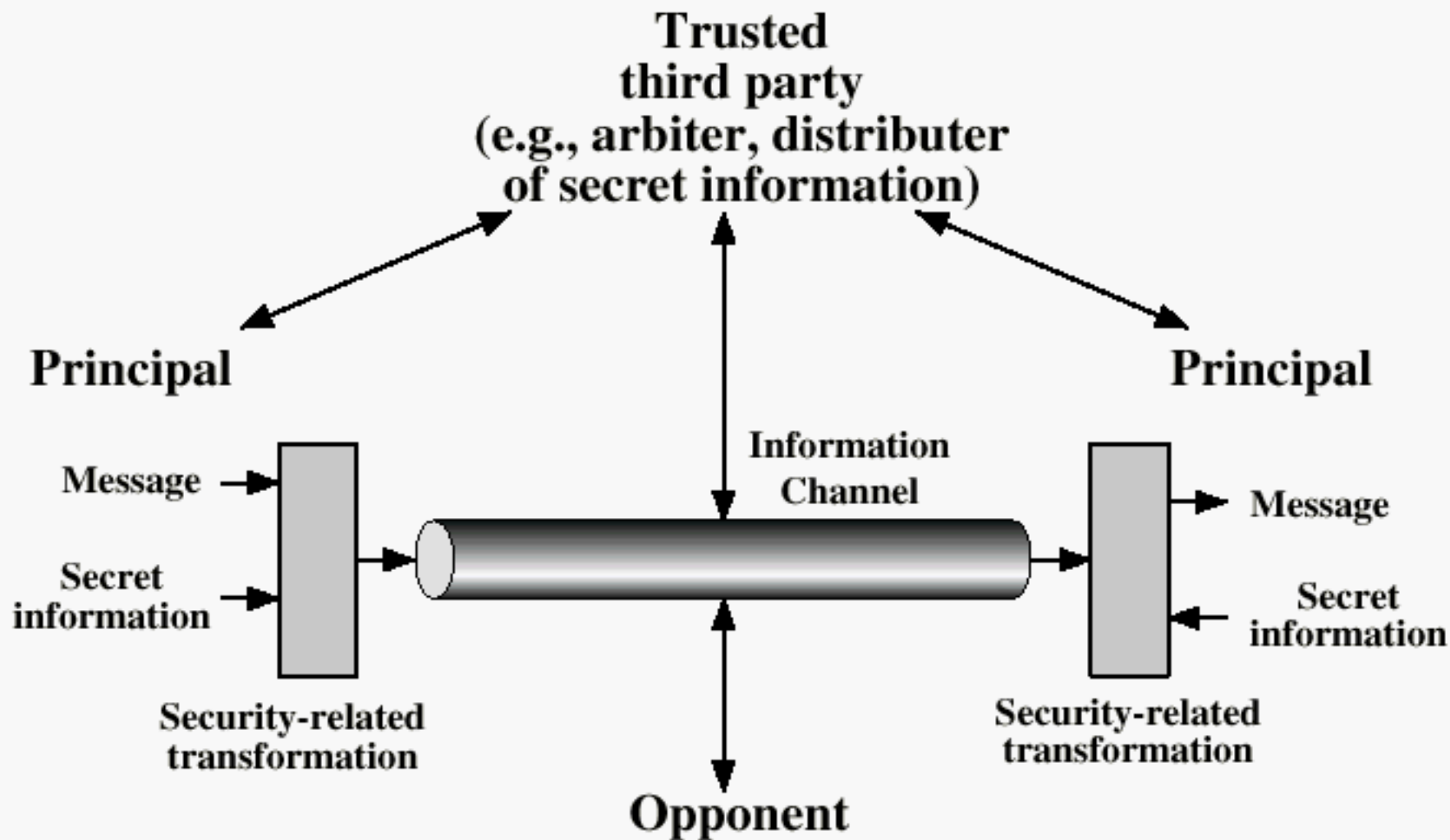
  - Virus that deletes files
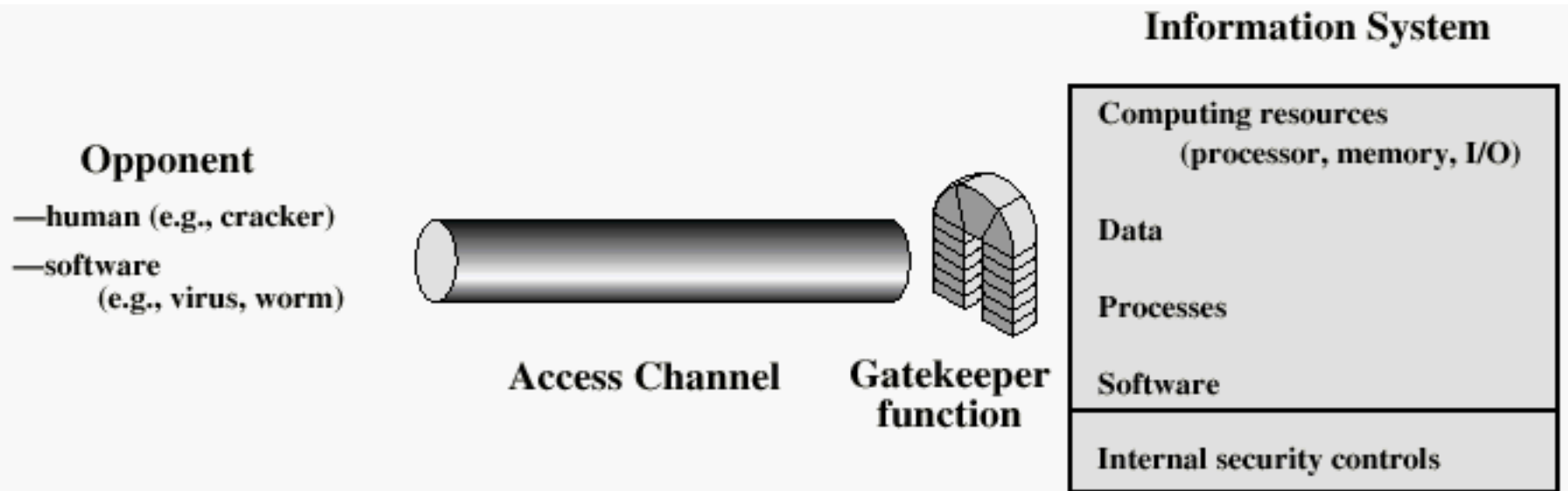
Figure 1.3   Model for Network Security

Figure 1.4 Network Access Security Model

Methods of Defence

- Encryption
- Software Controls (access limitations in a data base, in operating system protect each user from other users)
- Hardware Controls (smartcard)
- Policies (frequent changes of passwords)
- Physical Controls

Internet standards and RFCs

- The Internet society
  - Internet Architecture Board (IAB)
  - Internet Engineering Task Force (IETF)
  - Internet Engineering Steering Group (IESG)
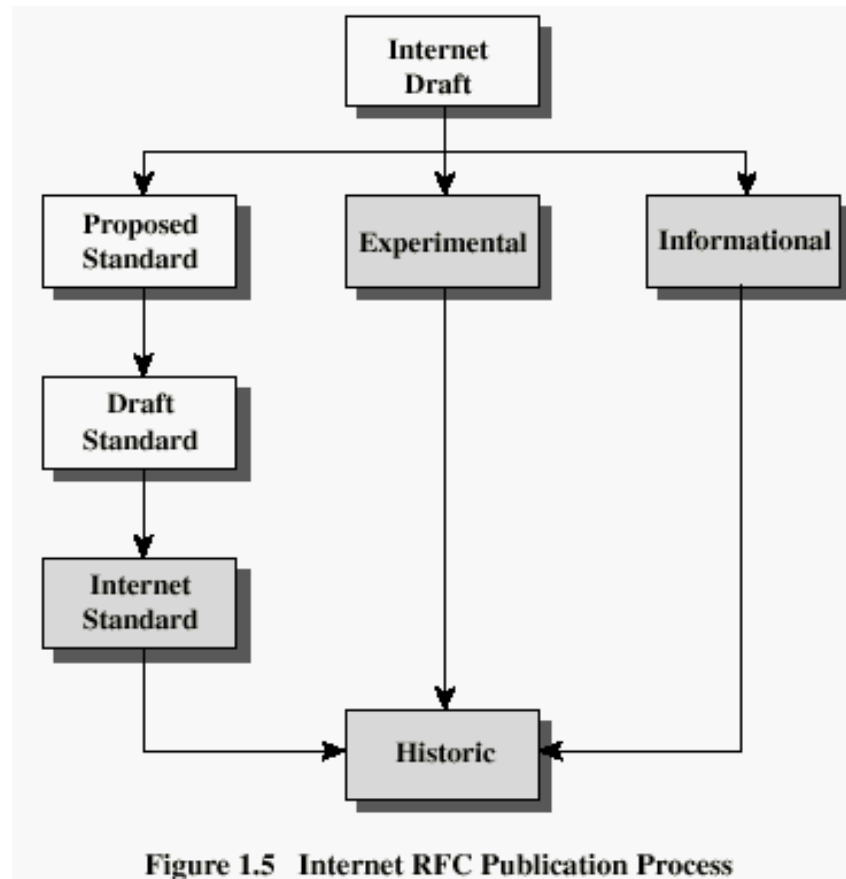
Internet RFC Publication Process

Figure 1.5   Internet RFC Publication Process

Henric Johnson