



Chapter 5

Privacy



Chapter Overview (1/2)

- Introduction
- Perspectives on privacy
- Disclosing information
- Ways information becomes public
- U.S. legislation
- Public records
- Covert government surveillance
- U.S. legislation authorizing wiretapping
- Data mining
- Identity theft
- Encryption

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Introduction

- Computers make the collection, analysis, storage, access, and distribution of information easier.
- More information collection and access → less privacy

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A Balancing Act

- Safeguarding personal and group privacy,
- Collecting relevant personal information essential for decision making government and organizations,
- Conducting the constitutionally limited government surveillance required to protect public order and safety.

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Trade-Offs

- Privacy vs. need for credentials
- Privacy vs. desire for free expression
- Privacy vs. safety / security



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Example Risks

- Risks associated with the computerized databases include:
 - Unauthorized use by “insiders,”
 - Inadvertent leakage through negligence or carelessness, and access by intruders,
 - Propagation of errors.

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Perspectives on Privacy

- Defining privacy
- Harms and benefits of privacy
- Is there a natural right to privacy?
- Privacy and trust

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Defining Privacy

- Privacy related to notion of access
- Access
 - Physical proximity to a person
 - Knowledge about a person
- Edmund Byrne: Privacy is a "zone of inaccessibility"
- Edward Bloustein: Privacy violations are an affront to human dignity
- Too much individual privacy can harm society
- Where to draw the line?

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Aspects of Privacy

- Freedom from intrusion.
- Control of personal information.
- Freedom from surveillance

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Foundations - U.S. Constitution

- Does not explicitly name privacy as a right. Decisions have found such a right in the "penumbra" of rights.
- Key limitations: (a) not clearly defined and (b) only effectively limits what government actors can/cannot do.

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Foundations - State Constitutions

- Vary among the states.
- Key drawbacks: (a) lack of uniformity and (b) many states do not independently decide cases based on their own Constitutions.
- Lockstep approach – interpret as coextensive with the US Constitution.

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Foundation - Federal Statutes

- Most prevalent approach. Can be placed in 3 broad categories:
 - (a) Limiting what information can be collected,
 - (b) Limiting what information can be disseminated (and how), and
 - (c) Requiring dissemination of information prior to a transaction.

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■ **These approaches have been applied in a variety of areas, including Social Security numbers, lending practices, credit practices, and banking practices to name a few.**

■ **Key limitations:**

- (a) lack of resources to effectively enforce, depending on which agency is charged with enforcement, and
- (b) Penalties for violations may be too lenient to serve as effective deterrents.

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Harms of Privacy

- Cover for illegal or immoral activities
- Burden on the nuclear family
- Hidden dysfunctional families
- Ignored people on society's fringes

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Benefits of Privacy

- Individual growth
- Individual responsibility
- Freedom to be yourself
- Intellectual and spiritual growth
- Development of loving, trusting, caring, intimate relationships

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Is There a Natural Right to Privacy?

- Morton Levine: Property rights → Privacy rights
- Third Amendment to U.S. Constitution
- Samuel Warren and Louis Brandeis, *Harvard Law Review* 193 (1890): Yes
- Judith Jarvis Thomson: "Privacy rights" overlap other rights
- Stanley Benn and Jeffrey Reiman: Privacy is a prudential right

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Brandeis

- "Moreover, 'in the application of a constitution, our contemplation cannot be only of what has been, but of what may be.'** The progress of science in furnishing the government with means of espionage is not likely to stop with wire-tapping. Ways may some day be developed by which the government, without removing papers from secret drawers, can reproduce them in court, and by which it will be enabled to expose to a jury the most intimate occurrences of the home. Advances in the psychic and related sciences may bring means of exploring unexpressed beliefs, thoughts and emotions. 'That places the liberty of every man in the hands of every petty officer,' was said by James Otis of much lesser intrusions than these. To Lord Camden, a far slighter intrusion seemed 'subversive of all the comforts of society.' Can it be that the Constitution affords no protection against such invasions of individual security?" (Olmstead v. United States, 277 U.S. 438 at 474)

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Privacy and Trust

- Modern life more private
- Challenge: living among strangers
- Remedy: establishing reputations
 - Ordeal, such as lie detector test or drug test
 - Credential, such as driver's license, key, ID card, college degree
- Establishing reputation → reducing privacy

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Disclosing Information

- Public record: information for public access
- Public information: information revealed to an organization that has right to share it
- Personal information: undisclosed information
- Types of disclosures
 - Voluntary
 - Involuntary
 - Statutory

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Ways Information Becomes Public

- Rewards or loyalty programs
- Body scanners
- Digital video recorders
- Automobile "black boxes"
- Enhanced 911 service
- RFIDs
- Implanted chips
- Cookies
- Spyware

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U.S. Legislation

- Fair Credit Reporting Act
- The Family Education Rights and Privacy Act
- Video Privacy Protection Act
- Financial Services Modernization Act
- Children's Online Privacy Protection Act
- Health Insurance Portability and Accountability Act

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Fair Credit Reporting Act

- Promotes accuracy and privacy of information used by credit bureaus
- Major credit bureaus: Equifax, Experian, Trans Union
- Negative information kept only 7 years
- Exceptions
 - Bankruptcies: 10 years
 - Criminal convictions: indefinitely

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Family Education Rights and Privacy Act (FERPA)

- Rights given to
 - Students 18 years and older
 - Parents of younger students
- Rights include
 - Reviewing educational records
 - Requesting changes to erroneous records
 - Preventing release of records without permission

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Video Privacy Protection Act

- Videotape service providers cannot disclose rental records without consumer's written consent
- Rental stores must destroy personal information related to rentals within a year of when it is no longer needed

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Financial Services Modernization Act

- Also called Gramm-Leach-Bliley Act of 1999
- Creates “financial supermarkets” offering banking, insurance, and brokerage services
- Privacy-related provisions
 - Privacy policies must be disclosed to customers
 - Notices must provide an opt-out clause
 - Companies must develop procedures to protect customers’ confidential information

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Children’s Online Privacy Protection Act

- Reduces amount of public information gathered from children
- Online services must gain parental consent before collecting information from children 12 and under

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Health Insurance Portability and Accountability Act

- Limits how doctors, hospitals, pharmacies, and insurance companies can use medical information
- Health care providers need signed authorization to release information
- Health care providers must provide patients with notice describing how they use medical information

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Examples of Public Records

- Census records
- Internal Revenue Service records
- FBI National Crime Information Center 2000

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Census Records

- Census required to ensure every state has fair representation
- Number of questions steadily rising
- Sometimes Census Bureau has broken confidentiality requirement
 - World War I: draft resisters
 - World War II: Japanese-Americans

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Internal Revenue Service Records

- Much personal information on tax forms
- Some IRS employees have misused access to IRS records
- IRS has also misplaced tapes and diskettes containing records

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FBI National Crime Information Center 2000

- NCIC
 - Collection of databases related to various crimes
 - Contains > 39 million records
- Successes
 - Helps police solve hundreds of thousands of cases every year
 - Helped FBI tie James Earl Ray to assassination of Dr. Martin Luther King, Jr.
 - Helped FBI apprehend Timothy McVeigh for bombing of federal building in Oklahoma

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Criticisms of the NCIC

- Erroneous records have led to false arrests
- Police have arrested innocent people with same name as someone in NCIC database
- FBI has used NCIC to keep records of people not suspected of any crime
- Corrupt law-enforcement employees have sold information and altered records
- Some law-enforcement employees illegally access the NCIC

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Code of Fair Information Practices

- No secret databases
- People should have access to personal information in databases
- Organizations cannot change how information is used without consent
- People should be able to correct or amend records
- Database owners, users responsible for reliability of data and preventing misuse

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Privacy Act of 1974 Falls Short

- Applies only to government databases
- Only covers records indexed by a personal ID
- No federal employee responsible to enforcing Privacy Act provisions
- Allows agencies to share records with other agencies

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Covert Government Surveillance

- 4th Amendment to U.S. Constitution
- Wiretaps and Bugs
- Operation Shamrock

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4th Amendment to U.S. Constitution

The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.

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Wiretaps and Bugs

- *Omstead v. United States* — wiretapping OK
- Federal Communications Act
- *Nardone v. United States* — wiretapping not OK
- FBI continues secret wiretapping
- *Katz v. United States* — bugs not OK

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Other Supreme Court Cases

- GRISWOLD ET AL. v. CONNECTICUT (1965)
- Stanley v Georgia (1969)
- Cruzan v. Missouri Dep't. of Health (1990)
- Lawrence v Texas (2003)

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Open Fields

- The open fields doctrine was first articulated by the U.S. Supreme Court in *Hester v. United States* (1924), which stated that "the special protection accorded by the Fourth Amendment to the people in their 'persons, houses, papers, and effects,' is not extended to the open fields."
- This opinion appears to be decided on the basis that "open fields are not a "constitutionally protected area" because they cannot be construed as "persons, houses, papers, [or] effects."
- While open fields are not be protected by the Fourth Amendment, the curtilage, or outdoor area immediately surrounding the home, is. Courts have treated this area as an extension of the house and as such subject to all the privacy protections afforded a person's home (unlike a person's open fields) under the Fourth Amendment.

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http://en.wikipedia.org/wiki/Reasonable_expectation_of_privacy

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Plain View Doctrine

- Able to seize items in plain view as long as three requirements are met (sometimes four)
- All three requirements must be present
- If one or more requirements is missing then not plain view

http://www.aast.edu/cjss/Course_Pages/CJUS_4200/Chapter%209.ppt
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Plain View Doctrine Requirements

- # 1 – Item must be seen by the officer
- # 2 – Officer must be legally present in the place from which the item is seen
- The officer must not have done anything illegal to get to the spot from which the items are seen

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Plain View Doctrine Requirements

- # 3 – Must be “immediately apparent” that the item is subject to seizure
- Recognition must be immediate and not the result of further prying or examination
- Example – can’t suspect item is stolen and get serial number to verify (justify by other means, consent or p/c and exigent circumstances)

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Operation Shamrock

- Continuation of World War II interception of international telegrams
- National Security Agency (1952)
- Expanded to telephone calls
- Kennedy
 - Organized crime figures
 - Cuba-related individuals and businesses
- Johnson and Nixon
 - Vietnam war protesters
- Nixon
 - War on drugs

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U.S. Legislation Authorizing Wiretapping

- Title III
- Electronic Communications Privacy Act
- Communications Assistance for Law Enforcement Act
- USA PATRIOT Act

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USA PATRIOT Act

- Provisions
 - Greater authority to monitor communications
 - Greater powers to regulate banks
 - Greater border controls
 - New crimes and penalties for terrorist activity
- Critics say Act undermines 4th Amendment rights
 - Pen registers on Web browsers
 - Roving surveillance
 - Searches and seizures without warrants
 - Warrants issued without need for showing probable cause

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Patriot Act Successes

- Charges against 361 individuals
 - Guilty pleas or convictions for 191 people
 - Shoe-bomber Richard Reid
 - John Walker Lindh
- More than 500 people removed from United States
- Terrorist cells broken up in Buffalo, Seattle, Tampa, and Portland ("the Portland Seven")

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Patriot Act Failure

- March 11, 2004 bombings in Madrid Spain
- FBI makes Brandon Mayfield a suspect
 - Claims partial fingerprint match
 - Conducts electronic surveillance
 - Enters home without revealing search warrant
 - Copies documents and computer hard drives
- Spanish authorities match fingerprint with an Algerian
 - Judge orders Mayfield released
 - FBI apologizes
- Civil rights groups: Mayfield was targeted for his religious beliefs

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Patriot Act Renewal

- Sixteen provisions scheduled to expire at end of 2005
- Bush administration advocated making all provisions permanent
- Congress likely to make most provisions permanent
- Controversial provisions
 - Roving wiretaps
 - Ability of FBI to seize records

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Founding Fathers Position

- **"Those who would give up Essential Liberty to purchase a little Temporary Safety, deserve neither Liberty nor Safety."**
- With the information thus far available the issue of authorship of the *statement* is not yet definitely resolved, but the evidence indicates it was very likely Ben Franklin

http://en.wikiquote.org/wiki/Ben_Franklin

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Data Mining

- Data mining
 - Searching for patterns or relationships in one or more databases
 - Way to generate new information
- Secondary use: information collected for one purpose used for another purpose
- Information about customers is a valuable commodity

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Data Mining Examples

- Marketplace: Households
- IRS audits
- Syndromic Surveillance System
- Total Information Awareness

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Total Information Awareness

- Proposed by Information Awareness Office of U.S. Defense Advanced Research Projects Agency (DARPA)
- Goal: identify terrorists
- Means: capture "information signatures" and looks for terrorist-like patterns of activity
- Financial, medical, communication, travel, and other records examined

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Criticisms of the TIA Program

- Large security and privacy risks
- Increase risk of identity theft
- No ability for citizens to check data reliability
- May hurt competitiveness of U.S. companies
- Identity theft introduces noise into database
- False positives could unfairly target millions of Americans
- Knowing about TIA will change people's behavior

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Ownership of Transaction Information

- Who controls transaction information?
 - Buyer?
 - Seller?
 - Both?
- Opt-in: consumer must explicitly give permission for the organization to share info
- Opt-out: consumer must explicitly forbid an organization from sharing info

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Identity Theft

- Background
- History and role of the Social Security Number
- Debate over a national ID Card
- REAL ID Act

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Background

- Identity theft: misuse of another person's identity to take actions permitted the owner
- Credit card fraud #1 type of identity theft
- Ease of opening accounts contributes to problem
- 10 million victims in 2004 alone
- Average loss: \$5,000

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Gaining Access to Information

- Mailboxes
- Lost or stolen wallets
- Dumpster diving
- Shoulder surfing
- Skimmers (wedges)
- Phishing

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ID Fraud

- Reported in 2005, only 54% of victims can identify source of leaked information.
- 12% victimized through online activity
- 63% victimized through traditional channels

http://news.com.com/Separating+myth+from+reality+in+ID+theft/2100_1029_3_5907165.html

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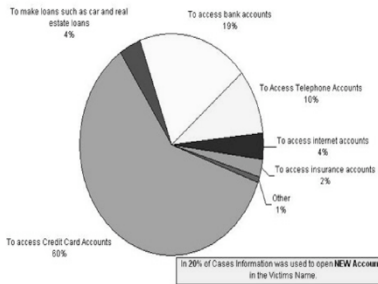
Method suspects used to obtain information	Number of Complaints	Percent
Method not known	58,078	61.7
Information not collected(non -FTC)	16,781	17.8
Method known	19,241	20.5
Total	94,100	100.00
Method known cases	Number of Complaints	Percent based on Subtotal
Access through relationship with victim	10,101	52.5
Wallet or purse containing identification was lost or stolen	6,615	34.4
Mail theft or fraudulent address changed filed	2,577	13.4
Application, financial, or employment records compromised	1,322	6.9
Burglary or break-in	686	3.6
Internet solicitation or purchase	462	2.4
Telephone or mail solicitation or purchase	132	0.7
Other	1,706	8.9
Information about method not provided	572	3.0
Subtotal	19,241	

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FTC Data (2000)

How Stolen Information Was Used



Source: Federal Trade Commission - Identity Theft Survey Report -

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History, Role of Social Security Number

- Social Security cards first issued 1936
- Originally used only for SS purposes
- Use of SSN has gradually increased
- SSN is a poor identification number
 - Not unique
 - Rarely checked
 - No error-detecting capability

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Arguments for a National ID Card

- Current ID cards are second-rate
- Would reduce illegal entry to U.S.
- Would prevent illegal aliens from working
- Would reduce crime
- Other democratic countries have national ID cards

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Arguments against a National ID Card

- No card positively guarantees identification
- No biometric-based system is 100% accurate
- No evidence it will reduce crime
- Makes government data mining simpler
- Make law-abiding people more vulnerable to fraud and indiscretions

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The REAL ID Act

- Signed in May 2005
- Significantly changes driver's licenses in the United States
- New licenses
 - Issued by end of 2008
 - Required to open bank account, fly on commercial airplane, or receive government service
 - Requires applicants to supply 4 different Ids
 - Will probably contain a biometric identifier
 - Must contain data in machine-readable form

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Possible Consequences of New Licenses

- Better identification means better law enforcement
- People won't be able to change identities
 - Parents ducking child support
 - Criminals on the run
- New, centralized databases could lead to more identity theft

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Biometrics (1/4)

- **measurable physical or behavioral trait used to recognize the identity of an individual**
- Behavioral
 - characteristics of how actions are performed
- Physiological
 - physical characteristics that must be recorded or measured at some point in time

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Biometrics (2/4)

- Behavioral
 - Fingerprint
 - Signature
 - Voice print
- Physiological
 - Hand geometry
 - DNA
 - Retinal image

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Biometrics (3/4)

- Properties
 - Universality - everyone has it
 - Uniqueness
 - Permanence - does not change with time
 - Collectability - some reasonable sensing device can be used to easily
 - Acceptability - the public or the users of the system would have no apprehensions about the data

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Biometrics (4/4)

- Activity
 - An Evaluation of Retinal Imaging Technology for 4-H Beef and Sheep Identification (2006) Journal of Extension
 - The challenges of environment and the human biometric device interaction on biometric system performance (2004) International Workshop on Biometric Technologies
 - Data Quality, Interoperability, Biometrics Fusion, and Template Ageing: Challenges for ePassport (2005) The Biometrics Consortium Conference
 - [Biometrics Exhibition and Conference 2006](#)
 - [NIST Biometrics Resource Center Website](#)

NIST recently tested both face and fingerprint recognition technologies using large realistic samples of biometric images obtained from several federal, state, and county agencies. Testing showed that fingerprints provide higher accuracy than facial recognition systems.

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State Actions

- *R.I. Gen. Laws § 11-49.2-1 (2006)*
- **Effective March 1, 2006**
 - A business that owns or licenses computerized unencrypted personal information about a Rhode Island resident shall implement and maintain reasonable security procedures and practices appropriate to the nature of the information, to protect the personal information from unauthorized access, destruction, use, modification, or disclosure.
 - A business that discloses computerized unencrypted personal information about a Rhode Island resident pursuant to a contract with a nonaffiliated third-party shall require by contract that the third-party implement and maintain reasonable security procedures and practices appropriate to the nature of the information, to protect the personal information from unauthorized access, destruction, use, modification, or disclosure.
 - Each violation of this chapter is a civil violation for which a penalty of not more than a hundred dollars (\$ 100) per occurrence and not more than twenty-five thousand dollars (\$ 25,000) may be adjudged against a defendant.

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HIPAA (1/2)

- Health Insurance Portability and Accountability Act of 1996
 - A major goal of the Privacy Rule is to assure that individuals' health information is properly protected while allowing the flow of health information needed to provide and promote high quality health care and to protect the public's health and well being.
 - The Rule strikes a balance that permits important uses of information, while protecting the privacy of people who seek care and healing.

U.S. Department of Health and Human Services,
Summary of the HIPAA Privacy Rule

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HIPAA (2/2)

- For internal uses, a covered entity must develop and implement policies and procedures that restrict access and uses of protected health information based on the specific roles of the members of their workforce.
- A covered entity must maintain reasonable and appropriate administrative, technical, and physical safeguards to prevent intentional or unintentional use or disclosure of protected health information in violation of the Privacy Rule and to limit its incidental use and disclosure pursuant to otherwise permitted or required use or disclosure.

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Encryption

- Symmetric encryption
- Public key cryptography
- Pretty Good Privacy
- Clipper chip
- Effects of U.S. export restrictions
- Digital cash

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Symmetric Encryption

- Single key used to encrypt and decrypt a message
- Both sender and receiver must have the key
- Problem: How does sender get key to receiver?
- If bad guy gets key, security is broken

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Public Key Encryption

- An example of asymmetric encryption
- Each person has two keys: public and private
- To send **R** a message, encrypt it with **R**'s public key
- **R** decrypts message with **R**'s private key
- No need to communicate keys
- Strong encryption: virtually impossible to figure out private key, given public key
- U.S. had export restrictions on strong encryption technology

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Pretty Good Privacy

- Phil Zimmerman created PGP
- He made it available on Internet
- Many people downloaded PGP
- U.S. government threatened legal action

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Clipper Chip

- "Clipper": NSA's encryption technology
- 1993: President Clinton announced Clipper as national standard for telephone encryption
- Justice Department issued guidelines for release of keys
- Huge public outcry
- 1994: Clipper designated a voluntary standard

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Effects of U.S. Export Restrictions

- Additional burden on U.S. software industry
 - Strong encryption okay for U.S. customers
 - Weak encryption needed for foreign customers
- Reduced international competitiveness of U.S. companies
- Two federal appeals courts ruled export restrictions violated freedom of speech (1999, 2000)
- U.S. State Department dropped export restrictions

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Digital Cash

- Digital cash
 - Anonymous electronic money
 - Relies upon blind signature protocol
- Two kinds of digital cash
 - Digital coins
 - Electronic checks
- Two implementations
 - Online system
 - Off-line system
- Benefits and harms
 - Benefit: promote privacy
 - Harm: simplify money laundering

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