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# **Information Assurance & Security 2**

**Digital Security and Concepts of Cryptography**

# Objectives

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- Understand the basics of digital security and the general concepts of cryptography in preparation for application and implementation
- Understand the different kinds of cryptographic protocols and the founding concepts that builds them

# Objectives (minor)

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- Describe the challenges of securing information
- Define information security and explain why it is important
- Identify the types of attackers that are common today
- List the basic steps of an attack
- Describe the five steps in a defense
- Explain the different types of information security careers

# Challenges of Securing Information

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- There is no simple solution to securing information
- This can be seen through the different types of attacks that users face today
  - As well as the difficulties in defending against these attacks

# Today's Security Attacks

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- Typical warnings:
  - A malicious program was introduced at some point in the manufacturing process of a popular brand of digital photo frames
  - Nigerian e-mail scam claimed to be sent from the U.N.
  - “Booby-trapped” Web pages are growing at an increasing rate
  - A new worm disables Microsoft Windows Automatic Updating and the Task Manager
  - Apple has issued an update to address 25 security flaws in its operating system OS X

# Today's Security Attacks (continued)

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- Typical warnings:
  - The Anti-Phishing Working Group (APWG) reports that the number of unique phishing sites continues to increase
  - Researchers at the University of Maryland attached four computers equipped with weak passwords to the Internet for 24 days to see what would happen
    - These computer were hit by an intrusion attempt on average once every 39 seconds

# Today's Security Attacks (continued)

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- Security statistics bear witness to the continual success of attackers:
  - TJX Companies, Inc. reported that over 45 million customer credit card and debit card numbers were stolen by attacker over an 18 month period from 2005 to 2007
  - The major security breaches that occurred during a three-month period
  - The total average cost of a data breach in 2007 was \$197 per record compromised
  - A recent report revealed that of 24 federal government agencies, the overall grade was only “C-”

| Organization   | Description of Security Breach  | Number of Identities Exposed |
|--|---|------------------------------|
| Safe Ride Services, Phoenix  | Employee personal information as well as patient demographic and insurance information was exposed.   | 42,000                       |
| American Express Travel  | Credit and debit card numbers from American Express, Visa, MasterCard, and Discover were in a man's possession and came from breaking into the computer systems of a restaurant and a restaurant supply business in the Seattle area.           | 27,257                       |
| Yahoo! Voices  | Attackers accessed passwords of over 450,000 Yahoo! Voices users and the information was posted online.   | 453,492                      |
| Formspring, San Francisco  | Attackers accessed Formspring's development server and posted the passwords of its users online.  | 28,000,000                   |
| University of Texas M.D. Anderson Cancer Center, Houston                     | A laptop with sensitive patient information was stolen from the home of a faculty member. It contained unencrypted patient names, medical record numbers, treatment and/or research information, and in some instances Social Security numbers. | 30,000                       |
| The Public Employees Retirement Association (PERA) of New Mexico Albuquerque | A computer containing PERA information was stolen from a consulting agency.   | 100,000                      |
| Bethpage Federal Credit Union, Bethpage, NY                                  | An employee accidentally posted data onto a file transfer protocol site that was not secure. The data contained customer Visa debit card names, addresses, dates of birth, card expiration dates, and checking and savings account numbers.     | 86,000                       |
| University of North Florida (UNF), Jacksonville                              | Multiple servers exposed Social Security numbers and other sensitive information. Students who submitted housing contracts since 1997 were affected.  | 23,246                       |

## Selected Security Breaches Involving Personal Information In A Three Month Period