

Introduction to Computer Applications

**CISY 1225
Chapter 4**

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CISY 1225 Custom book

Chapter 4

Securing Your System:
Protecting Your Digital Data and Devices

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Chapter Topics

- Computer virus types
- Protecting computers from viruses
- Hackers
- Firewalls
- Passwords and password management

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Chapter Topics (cont.)

- Biometrics
- Spyware and spam
- Backup methods
- Protecting physical assets

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Computer Threats

- Cybercrimes
 - criminal acts conducted through the use of computers, networks, and internet
- Computer users need
 - protect themselves from becoming victims of cybercriminals

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Types of Cybercrime

- Fraud-related
 - Nondelivery of ordered items
 - Credit and debit card fraud
 - Advanced fee scams
- Non-fraud-related
 - Computer intrusions
 - Unsolicited e-mail
 - Child pornography

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Computer Threats: Viruses

- Virus:
 - A program that attaches itself to another program and
 - spreads itself to other computers
- Viruses are hidden
 - within the code of a host program
- Any computing device can be infected with a virus

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What Viruses Do

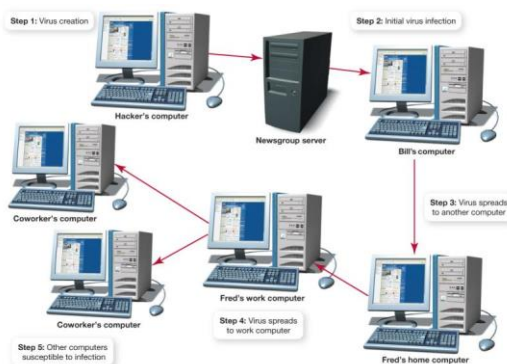
- Replicate themselves
 - Slow down networks
- Secondary objectives
 - Display annoying messages
 - Delete files on the hard drive
 - Change computer settings

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How Does a Computer Catch a Virus?

- Viruses copy themselves and infect a file on your computer
- Spread by
 - Sharing disks or flash drives
 - Opening an e-mail attachment
 - Downloading infected audio or video files



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Types of Viruses

- Boot-sector viruses
 - Replicate themselves in the boot sector of the hard drive
- Logic bombs
 - Activate when certain conditions are met
- Time bombs
 - Triggered by the passage of time or on a certain date
- Worms
 - Travel between systems through networks

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Types of Viruses (cont.)

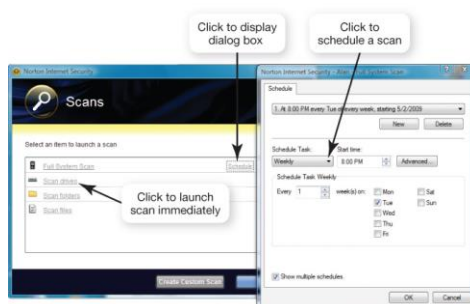
- Script viruses
 - Hidden on Web pages as miniprograms
- Macro viruses
 - Attached to documents
- E-mail viruses
 - Use e-mail address books to distribute themselves
- Encryption viruses
 - Compress files using a complex encryption key

Virus Classifications

- Polymorphic viruses
 - Periodically rewrite themselves to avoid detection
- Multipartite viruses
 - Infect multiple file types
- Stealth viruses
 - Erase their code from the hard drive and
 - reside in the active memory

Antivirus Software

- Programs designed to detect viruses
 - Scan files looking for virus signatures (unique code)
 - Provide options for deleting or fixing infected files
 - Inoculate files against further infection
- Needs to be updated frequently



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Dealing with an Infected Computer

1. Boot computer with antivirus installation disc.
2. Run directly from DVD/CD.
3. Allow software to delete or quarantine infected files.
4. Research viruses found to ensure further manual steps are not needed.

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Prevent Instant Messaging Viruses

- Allow contact from Buddy or Friends List users only.
- Never automatically accept transfers of data.
- Avoid using instant messaging programs on public computers.

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Other Ways to Protect Your System

- Keep your antivirus and operating system (OS) software up to date
- Load security patches as soon as they are available
- Enable automatic updates

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Hackers

- Anyone who unlawfully accesses a computer system
- Types of hackers
 - White hat
 - Black hat
 - Script kiddies



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What Hackers Steal

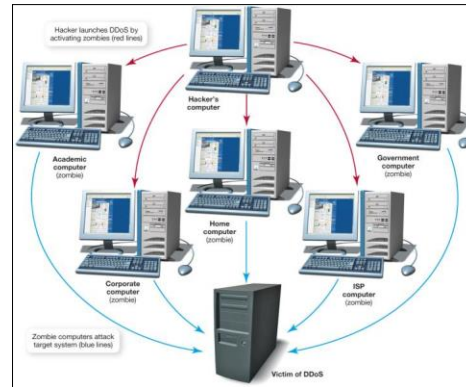
- Hackers try to steal data stored on hard drives:
 - Credit card numbers
 - Bank account numbers
- Also can steal information through packet sniffing or a keylogger
- Use information to purchase items illegally or to commit identity theft

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How Computers Are Attacked

- Trojan horse
- Backdoor program
 - Zombies
- Denial of service attacks (DoS)
- Distributed denial of service attacks (DDoS)



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How Hackers Gain Access

- Direct access
 - Hacking software
- Indirect access
 - Internet connection
 - Logical ports



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Firewalls

- Software programs or hardware designed to close logical ports to invaders
 - Most current operating systems include reliable firewalls
 - Security suite often include firewalls
 - Network routers can contain a hardware firewall
- Firewalls are critical
 - if you have an always on broadband connection
- Test your computer's vulnerability

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Bluetooth Attacks

- Bluesnarfing
 - Exploits flaw in access software to steal information contained on the device
- Bluebugging
 - Hacker takes control of the device
- Make your device invisible

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Passwords

- Create a strong password
 - At least 14 characters, including numbers, symbols, and upper- and lowercase letters
 - Not a single word or a word from a dictionary
 - Not easily associated with you (birthday, name of pet, nickname)
 - Use different passwords for different sites
 - Do not tell anyone or write down password
 - Change password regularly (every month)

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Wireless Networks on the Road

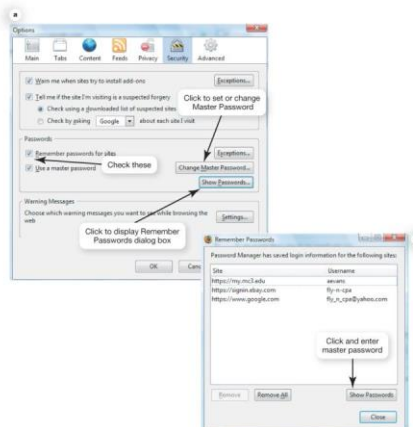
- Beware
 - “Evil twins”
 - Free Internet access in paid locations
- Protect yourself
 - Check with authorized personnel for official name of hotspot
 - Do not use free access from unknown sources

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Password Managers

- Remember all your different passwords
- Built into
 - Operating systems
 - Web browsers
 - Some security packages



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Anonymous Web Surfing

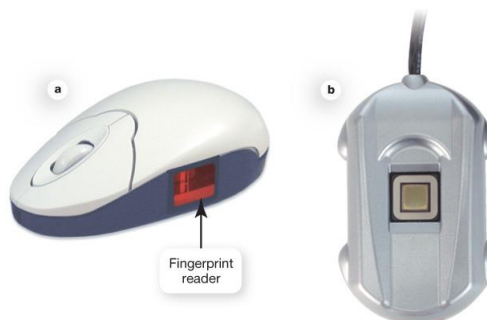
- Public computers
 - Shared computers risk subsequent user viewing your data
 - Might already have viruses or hacking tools installed
- Portable privacy devices
- Linux OS on a flash drive

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Biometric Authentication Devices

- Read unique personal characteristics
 - Fingerprint
 - Iris patterns
 - Voice patterns
 - Face patterns



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Malware

- Software that has a malicious intent
 - Grayware (nondestructive)
 - Adware
 - Spyware
 - Viruses (destructive)
- Antispyware software
 - Included in many Internet security suites
 - Stand-alone spyware removal available

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Spam or Spim

- Spam: Unwanted or junk e-mail
 - To avoid SPAM
 - Create free Web-based e-mail account for filling out online forms or making online purchases
 - Use a spam filter
 - *Do not* try to “unsubscribe” from spam e-mails
 - Use an e-mail forwarding service
- Spim: Unsolicited instant messages

Cookies

- A Web site assigns an ID number to your computer
 - stored in a cookie file
- Each time you log in to the site,
 - it notes the visit and keeps track of it in a database
- Provide info about browsing habits
- Identify user preferences
- Pose some privacy risks, but low security threat

Protecting Your Personal Information

- Protect information from identity thieves
 - Social Security number
 - Phone number
 - Street address
- Check privacy settings on social networking sites: Keep your information as private as possible

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Backing Up Your Data

- Backup
 - A copy of a file that can be used to replace the original
- Types of files to back up
 - Program
 - Data
- Backup routine
 - Frequency
 - Changed files

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Backing Up Your Data (cont.)

- Software programs for easy backup
 - Schedule automatic backups
 - Can back up files, folders, or entire drives
 - Back up to external hard drive, USB device, or DVD
- Entire system backup software
 - Takes an image of the entire system
 - Stores on a separate hard drive
 - In case of failure, a new drive is inserted

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Backing Up Your Data (cont.)

- Store backups offsite
- Online backups
 - Store backup files on Internet servers
 - Some services free
 - Windows Live Sky Drive
 - ADrive
 - Fees for some services
- Network attached storage (NAS) devices

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Social Engineering

- Uses social skills to generate human interaction to entice individuals to reveal sensitive information
 - Usually does not use a computer or face-to-face interaction
 - Pretexting

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Phishing and Pharming

- Phishing
 - Uses e-mail to lure user to fake Web sites
 - Tricks user into revealing private data
- Pharming
 - Malicious code changes Web browser's ability to find Web addresses

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Hoaxes

- An attempt to make someone believe something that is untrue
 - Target large audiences
 - Practical joke, agents of social change, or time wasters
 - Mostly e-mail



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Protect Physical Assets

- Environmental factors
 - Avoid
 - Sudden movement
 - Excessive heat or cold
 - Dust
 - Food and liquids
 - Use padded case for notebooks

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Power Surges

- Occur when electrical current is supplied in excess of normal voltage (120 volts in the United States)
- Caused by:
 - Old or faulty wiring
 - Downed power lines
 - Malfunctions at electric substations
 - Lightning strikes
- Use surge protectors

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Deterring Theft

- Alarms
- Locks
- Software alerts



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Chapter 4 Summary Questions

- From which types of viruses do I need to protect my computer?

Chapter 4 Summary Questions

- What can I do to protect my computer from viruses?

Chapter 4 Summary Questions

- How can hackers attack my computing devices, and what harm can they cause?

Chapter 4 Summary Questions

- What is a firewall, and how does it keep my computer safe from hackers?

Chapter 4 Summary Questions

- How do I create secure passwords and manage all of my passwords?

Chapter 4 Summary Questions

- How do I manage online spyware and spam?

Chapter 4 Summary Questions

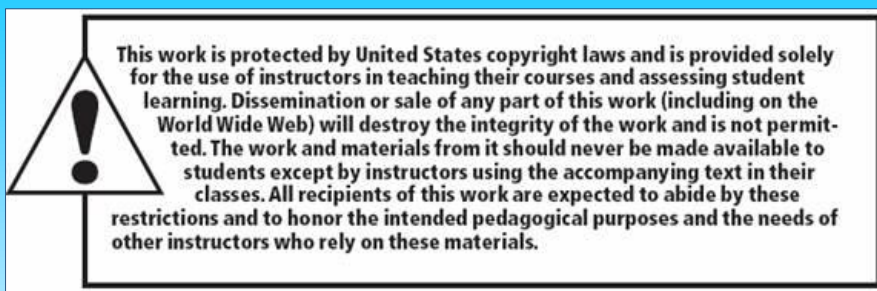
- What data do I need to back up, and what are the best methods for doing so?

Chapter 4 Summary Questions

- What is social engineering, and how do I avoid falling prey to phishing and hoaxes?

Chapter 4 Summary Questions

- How do I protect my physical computing assets from environmental hazards, power surges, and theft?



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