Computer Security & Risks

Chapter 11 Part 2

Outline

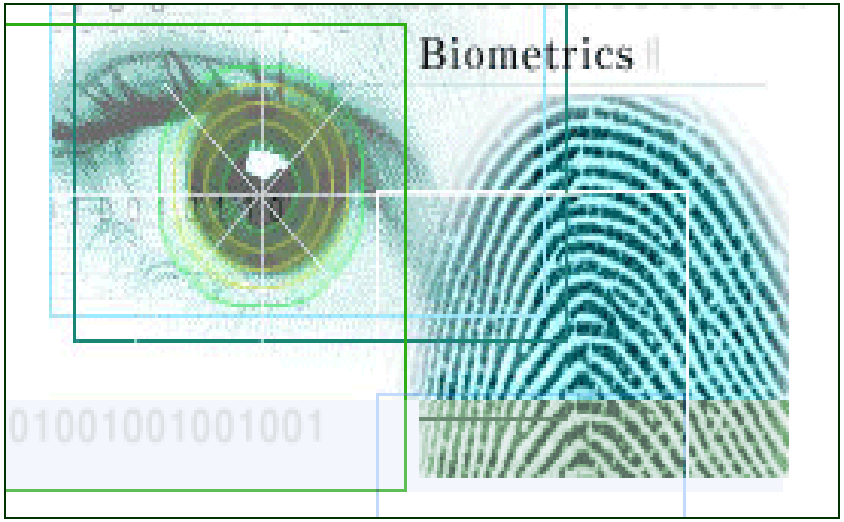
- Protection
  - Passwords
  - Firewalls
  - Encryption
  - Audit Control
  - Backup
- Security vs Privacy
- Security vs Civil Rights
- Cyberwar

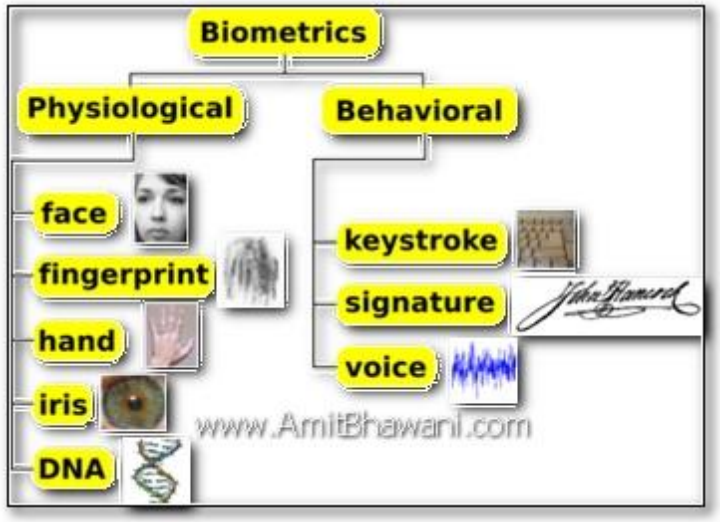
Physical Access Restriction

Something You **Have**	• Key • Access Card
Something You **Know**	• Password • Lock Combination
Something You **Do**	• Signature • Typing speed • Error Pattern
Something **About You**	• Voice Print • Fingerprint • Retinal Scan

Security Biometrics

- Identification of humans by their traits to get Access Control
  - Examples: Fingerprints, Retina Scan, etc…





Passwords and Access Privileges

- Password:
  - Most common tool used to restrict access to computers
- Effective Passwords:
  - Not real words
  - Not names
  - Changed frequently
  - Combination of letters and numbers

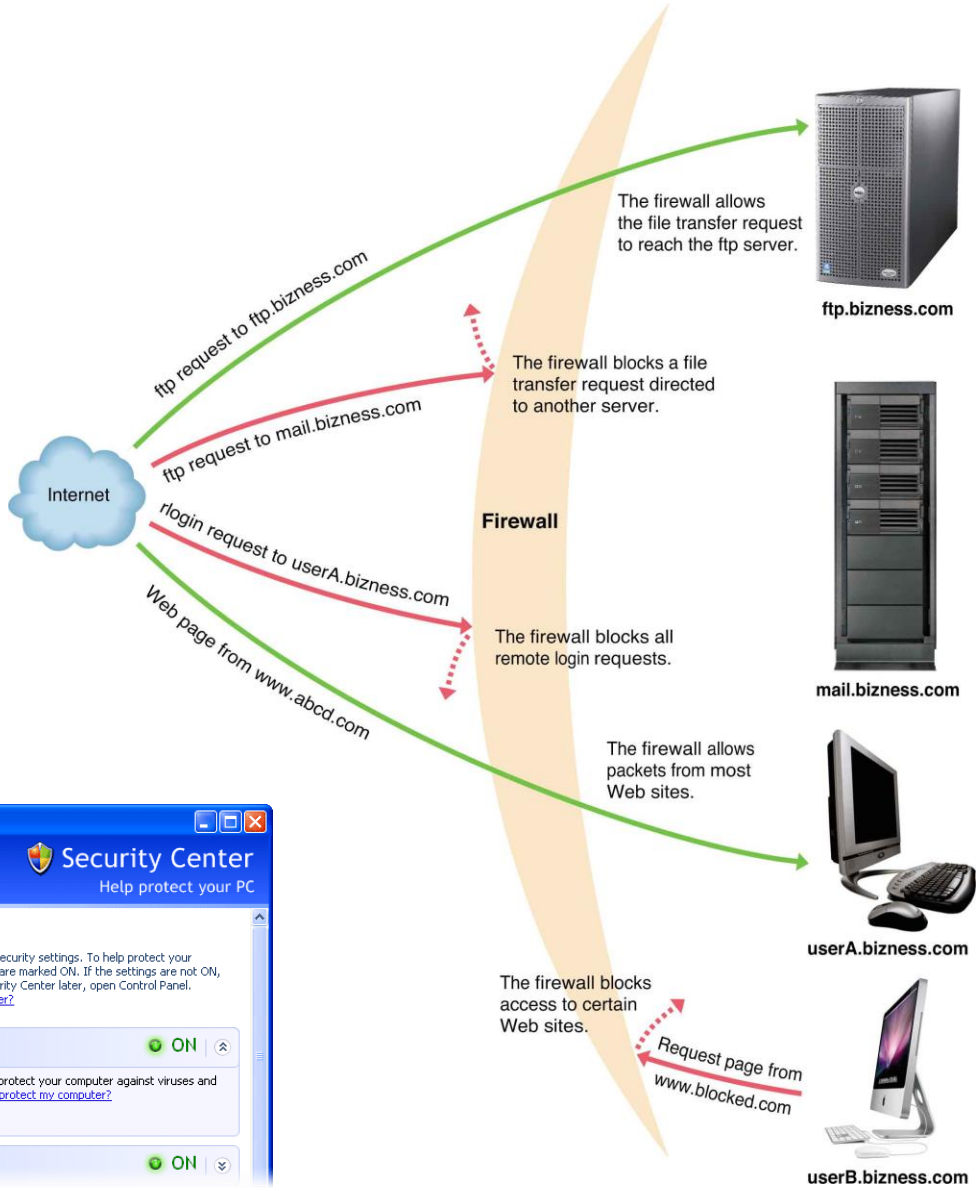
Strong Password Rules	Bad Example	Better Example
Passwords should have more than 8 characters; mix letters, numbers and symbols as well as mix between upper and lower case letters	password 12345678	Mtwf!382 GatsbJ11*)
Don't use a password someone can guess, such as your name, birthday.	Saeed1994 1stMarJohn	S@ed#1$9 13j*nUiM

Passwords and Access Privileges

- Access Control Software
  - Doesn't need to treat all users identically
- System Administrator
  - At least one of the accounts on a PC must be Admin
  - Has additional privileges
    - Permission to install additional software
    - Change system settings

Firewalls

- It filters information between a private network and the rest of the internet.
- It could be either
  - Software
  - Hardware



Encryption Software

- Scrambling transmitted messages to secure them using a secret numerical code called
  - Encryption Key
- Reverse process to retrieve original message called **decryption**

Software sabotage Protection

- Anti-virus
  - Search for viruses and delete them
  - Continually monitor the system for viruses
  - Need to be frequently revised for new viruses
  - Several days required to develop patches for new viruses

Audit Control Software

- Monitoring and Recording user computer transactions
  - Tracing and identifying suspicious computer activity

Audit Log

Selected Date: **Last 24 Hours**
Event: **No Filter** — No Filter Applied
Login: **No Filter**
Database Revision: **No Filter**
Type: **No Filter**
Name: **No Filter**
Show/Hide Audit Log Events: **Show**

Audit Log

Notice the difference in the Group name, and Event status.

Date	Login	Event	Type	Name
May 3, 2011 11:57:40	admin	View	Admin S	Audit Log
May 3, 2011 11:52:43	admin	View	Group	Group Manager
May 3, 2011 11:52:42	admin	System	Admin Settings	Restart XLi engine
May 3, 2011 11:52:42	admin	Update	Group	Group Member List
May 3, 2011 11:52:42	admin	Update	Group	Monitor Group Only (ID:7)
May 3, 2011 11:52:25	admin	View	Group	Group Member List
May 3, 2011 11:52:21	admin	View	Group	Monitor Group Only (ID:7)
May 3, 2011 11:52:14	admin	View	Group	Group Manager
May 3, 2011 11:44:11	admin	View	Admin Settings	Audit Log
May 3, 2011 11:43:56	admin	View	Admin Settings	Audit Log
May 3, 2011 11:43:50	admin	Rename	Group	Monitor Only Group (ID:7)
May 3, 2011 11:39:24	admin	View	Group	Group Manager
May 3, 2011 11:39:10	admin	View	Internet Usage Rule	Internet Usage Rules Manager
May 3, 2011 11:38:46	admin	View	Group	Group Manager
May 3, 2011 11:38:37	admin	View	Admin Settings	Conductor Settings
May 3, 2011 11:35:06	admin	View	Admin Settings	Conductor Settings
May 3, 2011 11:35:05	admin	Update	Admin Settings	Conductor Settings

Backups & Other Precautions

- The best and most widely used data recovery insurance is **Regular Backups**
- Types of backups
  - Incremental
    - Happens more or less continuously; e.g. Hourly, Daily
  - Bootable
    - Makes a complete duplicate of a disk; e.g. backup drive in laptops
  - Off-site
    - Transport DVDs of data to remote sites or by uploading data into the internet cloud

Backups & Other Precautions

- UPS: Uninterrupted Power Supply
  - Protects data loss due to Power failure
- Surge Protector
  - Shields electronic equipment from dangerous power spikes

Safe Computing

- If it's important, back it up.
- If it's sensitive, lock it up.
- Treat your removable discs and drives as if they contained something important.
- If you're sending sensitive information, consider encryption.
- Share with care.
- Beware of email bearing gifts.
- Handle shareware and freeware with care.
- Don't pirate software.
- Disinfect regularly.
- Take your passwords seriously.

Security vs Privacy (YouTube)

- Security measures prevent crime but they can also threaten privacy
- Smart badges
  - broadcast identification codes
  - A badge-location database stores data about the location of the badge (or person wearing the badge)
  - Instead of paging the entire hospital, an operator could route the call based on your location from your badge.
- Smart phones have similar technology called proximity recognition technology

Security vs Civil Rights

- New laws are being created and questions about civil rights are being raised.
  - Many hackers arrested and punished
- Laws introduced new problems by threatening rights of citizens
  - Professor Edward Felton was threatened with a lawsuit if he presents a paper analyzing the system that encodes digital music

UAE Cybercrime Law

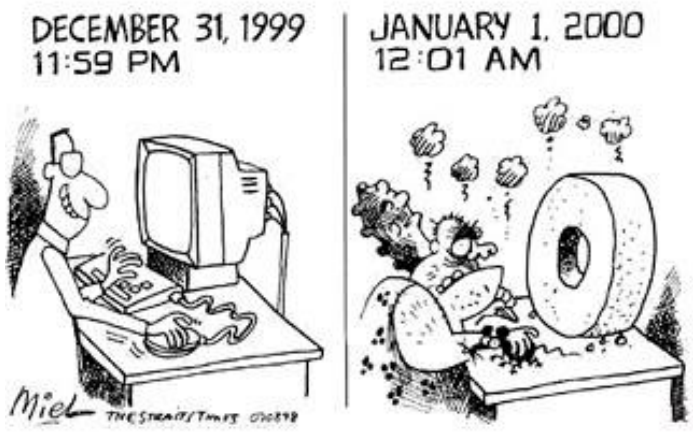
- UAE Cybercrime Law No 5 of 2012
  - Any form of misuse of a computer/smart device or an electronic network/system .
  - Includes stern punishments that could go up to a life sentence and/or a fine varying between Dh50,000 and Dh3 million depending the severity and seriousness of the cybercrime.
    - E.g. breaching someone's privacy by copying, saving or publishing their photo or personal data using an electronic device is an offence punishable by at least six months in prison and/or a fine of up to Dh500,000, even if the photo was taken in a public place.

Security & Reliability

- Software Bugs
  - It cause more damage than viruses
- It is impossible to eliminate all bugs
  - The bigger the system the bigger the problem

Security & Reliability

- Y2K Bug
  - For decades only two digits were used for year; e.g. (89 → 1989)
  - But in 2000 it would become 00 causing calculation errors.
- More than 100 billion dollars spent to avert the disaster
  - Many programs had to be changed



Computers at War

- Smart weapons
  - Missiles that use computerized guidance systems to locate their targets
- Autonomous system
  - Complex system that can assume almost complete responsibility for a task without human input

Computers at War: Cyber Warfare

- By attacking computer networks the enemy can cripple: (YouTube)
  - Telecommunications
  - Power grids
  - Water and gas supplies