Computer & Network Security

Lecture 7-1

Computers & Society (CPSC 430)

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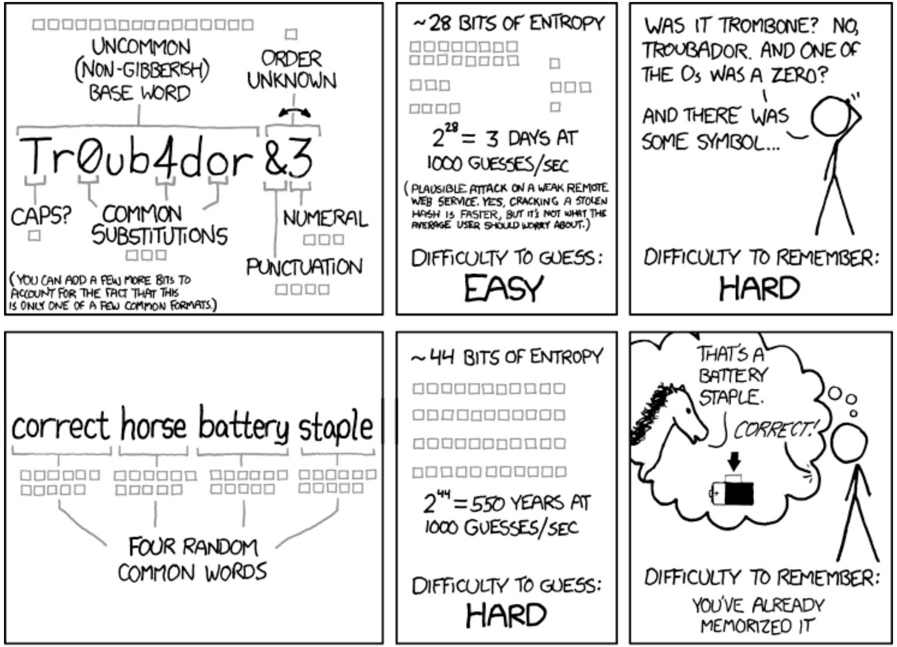
Password Strength


UNCOMMON (NON-GIBBERISH) BASE WORD
ORDER UNKNOWN
Tr0ub4dor &3
CAPS?
COMMON SUBSTITUTIONS
NUMERAL
PUNCTUATION
(YOU CAN ADD A FEW MORE BITS TO ACCOUNT FOR THE FACT THAT THIS IS ONLY ONE OF A FEW COMMON FORMATS.)
~28 BITS OF ENTROPY
2^28 = 3 DAYS AT 1000 GUESSES/SEC
(PLAUSIBLE ATTACK ON A WEAK REMOTE WEB SERVICE. YES, CRACKING A STOLEN HASH IS FASTER, BUT IT'S NOT WHAT THE AVERAGE USER SHOULD WORRY ABOUT.)
DIFFICULTY TO GUESS: EASY
WAS IT TROMBONE? NO, TROUBADOR. AND ONE OF THE Os WAS A ZERO?
AND THERE WAS SOME SYMBOL...
DIFFICULTY TO REMEMBER: HARD
correct horse battery staple
FOUR RANDOM COMMON WORDS
~44 BITS OF ENTROPY
2^44 = 550 YEARS AT 1000 GUESSES/SEC
DIFFICULTY TO GUESS: HARD
THAT'S A BATTERY STAPLE.
CORRECT!
DIFFICULTY TO REMEMBER: YOU'VE ALREADY MEMORIZED IT

THROUGH 20 YEARS OF EFFORT, WE'VE SUCCESSFULLY TRAINED EVERYONE TO USE PASSWORDS THAT ARE HARD FOR HUMANS TO REMEMBER, BUT EASY FOR COMPUTERS TO GUESS.

Hackers

- Hacker (original meaning):
  - Explorer, risk-taker, technical virtuoso
  - Values free exchange of information; mistrusts authority; values technical skill; holds an optimistic view of technology

- Hacker (ultimate meaning):
  - Teenagers accessing corporate or government computers
  - Stealing and/or destroying confidential information

- What hasn’t changed: hackers’ public image

Ethics of Hacking

- Parallels between hackers/phreaks & MP3 downloaders
  - Establishment overvalues intellectual property
  - Use of technology as a "joy ride"
  - Breaking certain laws considered not that big a deal
  - (Guess what the police, RIAA thinks about these arguments?)

- *Have you ever hacked anything?*
- *Which, if any, forms of hacking do you consider ethical?*
- *Is it wrong to learn hacking or phreaking skills, if these skills are never put to use?*

Malware: Evil Code that can Run on Your Computer

- **Viruses**
  - What is a virus?
  - *Have you ever (knowingly) gotten one?*
- **Worms**
  - What is a worm? How is it different from a virus?
  - *Is it wrong to distribute a virus or worm that doesn't harm anyone?*
- **Trojan Horses**
  - What is a Trojan horse? How is it different from the first two?

- *Do the victims of a virus/worm/Trojan horse share responsibility for being attacked if their system is not up to date?*

Malware II: More Evil Code

- **Spyware/Adware**
  - What is spyware? What is adware?
  - *Is it ever moral to install spyware/adware on a user’s computer without their consent?*
- **Drive-by Downloads**
  - What is a drive-by download?
  - *What do you think the best defenses are against them?*
- **General-purpose Defensive Measures**
  - security patches
  - anti-malware tools
  - firewalls
  - *Anything else?*

Attacks: how mean computers hurt nice computers

- **How:**
  - Phishing
    - *Have you been targeted? Has an attack been successful?*
  - [Distributed] Denial of Service
  - Ransomware attacks
- **Why:**
  - Cybercrime: professionalization of malware
    - renting botnets (DDoS; spam)
    - stealing credit card numbers, passwords