



# Lecture 7-2

## Computer and Network Security

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# Participation Quiz

You are the conductor of a train. It is headed down on one track where you see 5 workers fixing the track. They cannot hear, see, or feel the train coming. You know for a fact that the train is going fast enough to kill them if a collision occurs. However, you notice there is an alternate track ahead that you can switch the train onto. It has 1 worker and again, she cannot hear, see, or feel the train coming. Do you make the switch to the alternate track?

A: Make the switch, 5 live and 1 dies

B: Do not make the switch, 5 die and 1 lives

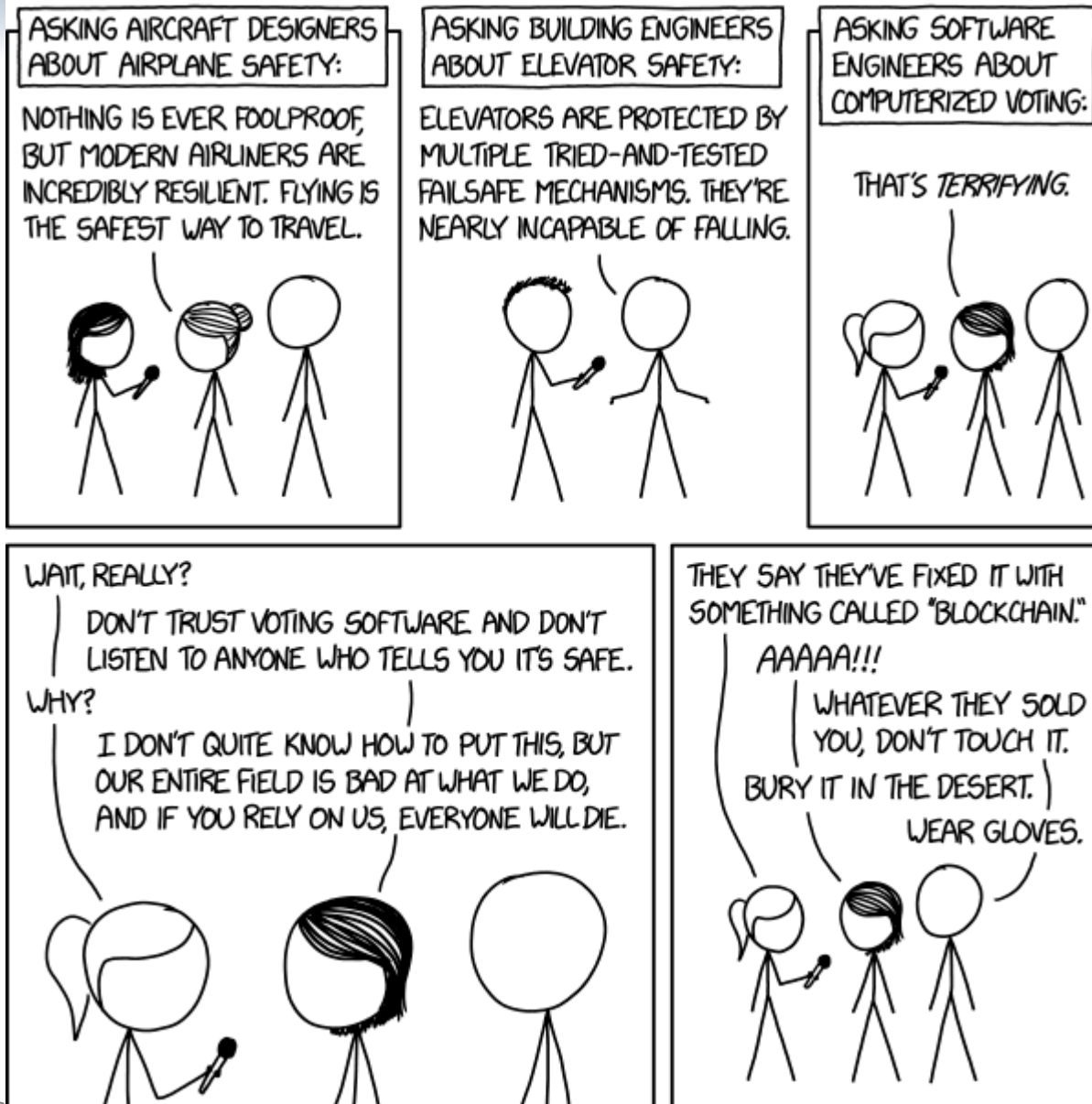
# Participation Quiz

You are a doctor working at a hospital. You have 5 patients. They are in dire need of an organ; a different one for each patient. They need a new organ immediately or they will die. Thinking fast, you remember that there is a patient of yours next door who just came for a check-up. He is asleep. You know that if you do not take his organs for transplant your 5 patients will die. If you do take the organs, they will survive (and for the sake of argument, assume they will have a normal life after transplant). There are no other options. Do you take the organs?

A: Take the organs, 5 live and 1 dies

B: Leave the patient alone, 5 die and 1 lives

# A student contribution...



# Electronic Money

- Financial transactions are increasingly moving online
- Advantages
  - easier transactions
  - easier access to credit
  - discourages black market economy
  - prevents businesses from having to carry cash floats
- Disadvantages
  - empowers a few corporations
  - less anonymity
  - security risks
- *Other advantages/disadvantages? What do you think?*

# Blockchain

- Distributed ledgers offer an alternative approach to electronic money that works more like cash
- What is:
  - blockchain?
  - mining?
  - what stops someone from spending the same digital money twice?
- But, the currency is incredibly volatile (and, not everyone even agrees that it makes sense to think of it as money)
  - In the last day, there has been a large decline in value (prompted by a hard fork in Bitcoin Cash)...

*What do you think? Should governments encourage blockchain-based currencies? Do you use them?*

# 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**
- **Why:**
  - **Cybercrime: professionalization of malware**
    - renting botnets (DDoS; spam)
    - stealing credit card numbers, passwords
  - **Cyberwarfare: states as actors or targets**
    - North Korea vs USA gov, corporate sites (2009)
    - Russia vs Georgia during and after South Ossetia war (2008)
    - Stuxnet (2009-)
    - A variety of government, activist sites during Arab Spring (2011)
    - Anonymous

# Poll

Do you have citizenship in a country other than Canada?

A: Yes

B: No

# Hacking as a means of warfare/foreign policy

What hacking/cyberwarfare activities are ethical? Which are unethical? What such capabilities should Canada attempt to develop? What should Canada do to attempt to discourage and/or insulate itself from unethical attacks?