



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

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)

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?