


Viruses and self replicating programs

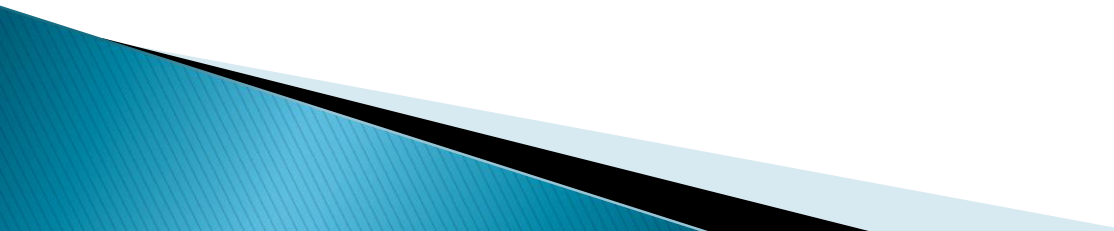
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Introduction

- ▶ Viruses
 - ▶ Worms
 - ▶ Trojan Horses
 - ▶ The early viruses
 - ▶ Concept of a good virus
 - ▶ Arguments for good viruses
 - ▶ Arguments against good viruses
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Introduction

- ▶ Examples of good viruses
 - ▶ Ethical analysis
 - ▶ Summary
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Viruses

▶ Definition

- A piece of self-replicating code within another program

▶ Example

- Melissa Virus
 - Spread through e-mail
 - Activated by a user opening a document
 - Replicated itself and was sent to others in address book

Worms

▶ Definition

- A self-contained program that spreads through a computer network.
- Doesn't need to attach itself to another program

▶ Example

- Code Red
 - Targeted web servers and web pages
 - Exploited MS's Internet Information Services
 - Original purpose was to DDoS attack to the White House website

Trojan Horses

▶ Definition

- A program with a benign capability that conceals another program

▶ Example

- Sub7
 - Opens a port to allow an attacker to gain control of the computer

Early viruses

▶ Creeper Virus

- Released on ARPANET in 1972
- Left a message on the machine: I'm the creeper, catch me if you can!
- Transfer to another computer and delete itself

Early viruses

▶ Elk Cloner

- Written in 1982
- Considered to be the first boot sector virus
- Every 50th boot, the virus would display a message:
Elk Cloner: The program with a personality
It will get on all your disks
It will infiltrate your chips
Yes, it's the Cloner!
It will stick to you like glue
It will modify ram too
Send in the Cloner!
- Written as a practical joke by a 15 year old high school student

Early Viruses

- ▶ Brain Virus
 - Released in 1986
 - Replace the boot sector of a hard drive and create a text message
 - It wasn't supposed to be malicious
 - Creators revealed their contact information in the message

Concept of a good virus

- ▶ A virus is software that is self-replicating
- ▶ Software written for beneficial purposes
- ▶ Fred Cohen
 - “Living programs”

Arguments for good viruses

- ▶ Vesselin Bontchev
 - Anti-virus virus
 - Den_Zuko
 - Removed the Brain virus
 - File compressor
 - Cruncher
 - Disk Encryptor
 - Maintenance Virus
- ▶ To create awareness of security holes

Arguments for good viruses

▶ Shane Coursen

- Even if a patch is available, it may not be applied
- To fight viruses, kill the virus faster than it can replicate
- Not a question of whether we should create them, but how far we go when we do

Arguments against good viruses

- ▶ Bontchev
 - Lack of control
 - Recognition
 - Anti-virus software
 - Resource wasting / bandwidth wasting
 - Bug Containment
 - Compatibility
- ▶ Modern operating system's features

Examples of good viruses

▶ Internet Worm

- Not designed to be malicious
- Exploit bugs found in Unix programs:
 - FTP, sendmail, finger
- Supposed to avoid slow machines and only consume CPU cycles if machines were idle
- The virus was analyzed and the bugs were discovered
- The worm actually infected a machine multiple times

Examples of good viruses

- ▶ John Shoch's worm
 - Distributed computation
 - Only seek out idle machines
 - A bug in the worm caused machines to crash
 - Included measures to disable the worm

Examples of good viruses

- ▶ **Welchia Worm**
 - Downloaded Microsoft updates
 - Removed the Blaster Worm
 - Did not cause any damage
 - Used up bandwidth & caused computers to restart

Examples of good viruses

- ▶ **Reaper Virus**
 - Removed the Creeper virus
 - No real drawbacks

Examples of good viruses

- ▶ Crclean and Code Green
 - Used a released MS patch to stop the Code Red worm
 - Both came with warnings about their viral techniques

Ethical Analysis

- ▶ Kantianism
 - A person's will
 - Creating a virus to fight a virus
 - Intent is difficult to determine
 - Other factors to consider

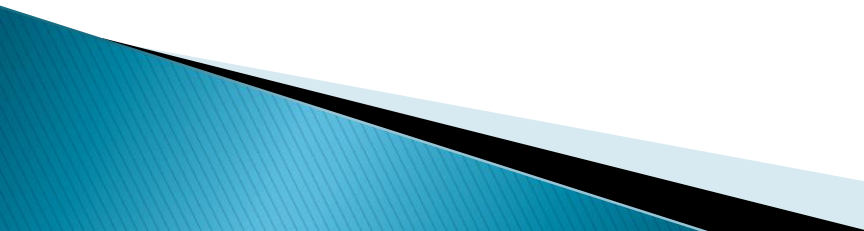
Ethical Analysis

- ▶ Utilitarian evaluation
 - Overall benefits vs. overall harm
 - Viruses that removed malicious viruses
 - An ideal case
 - Many viruses with good intentions have had bugs
 - Overall harm is greater than the overall benefit

Ethical Analysis

- ▶ Social contract theory
 - Permits an action if the rest of society view it as useful and if rational people view it as moral.
 - Installing software without a user's consent
 - Most people would object to this
 - Not an ethical view that supports beneficial viruses

Summary

- ▶ Self-replicating software can be malicious or beneficial
 - ▶ There have been beneficial self-replicating programs
 - Many of these programs have had bugs
 - Fail to address ethical concerns
 - ▶ Self-replicating programs are not ready to be accepted
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