The Latest Malware Threats Against Your PC

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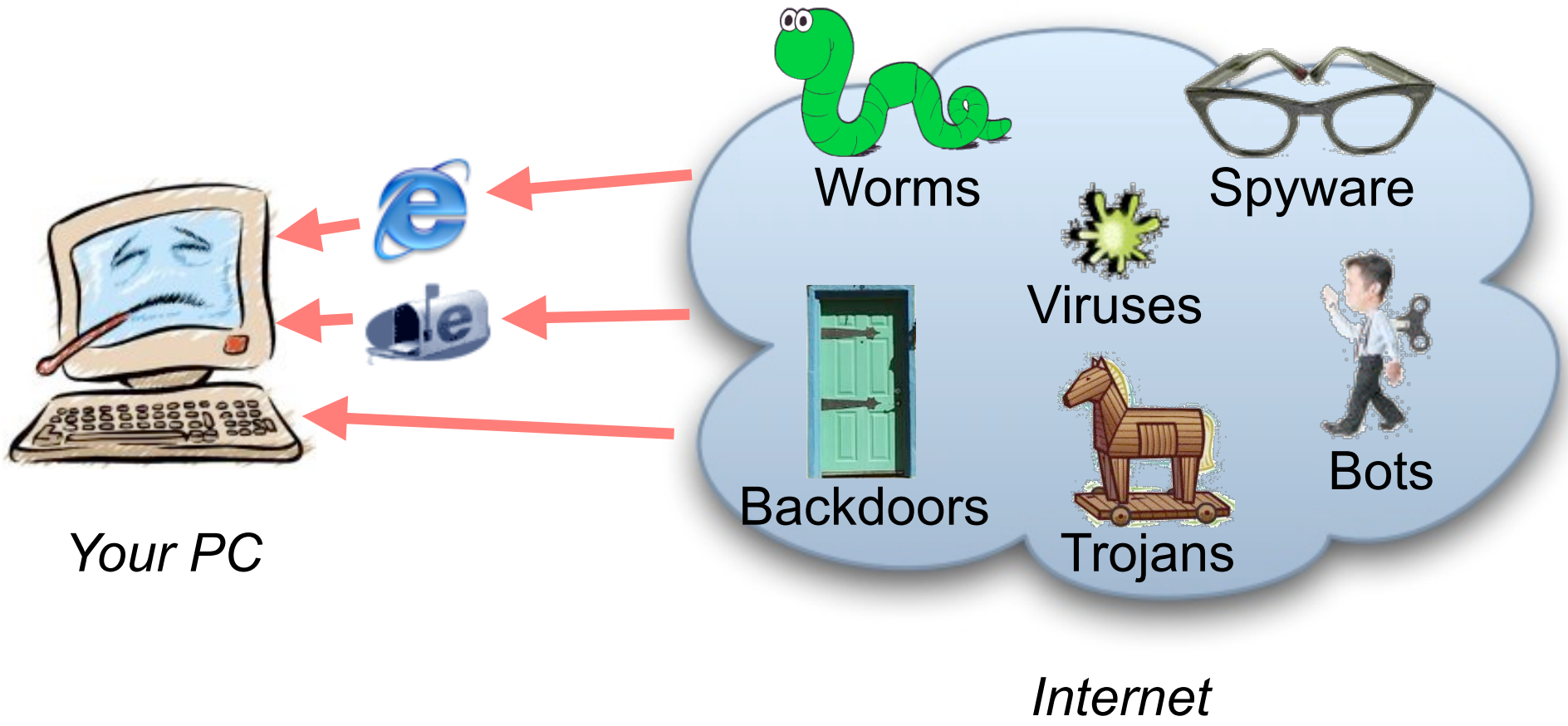
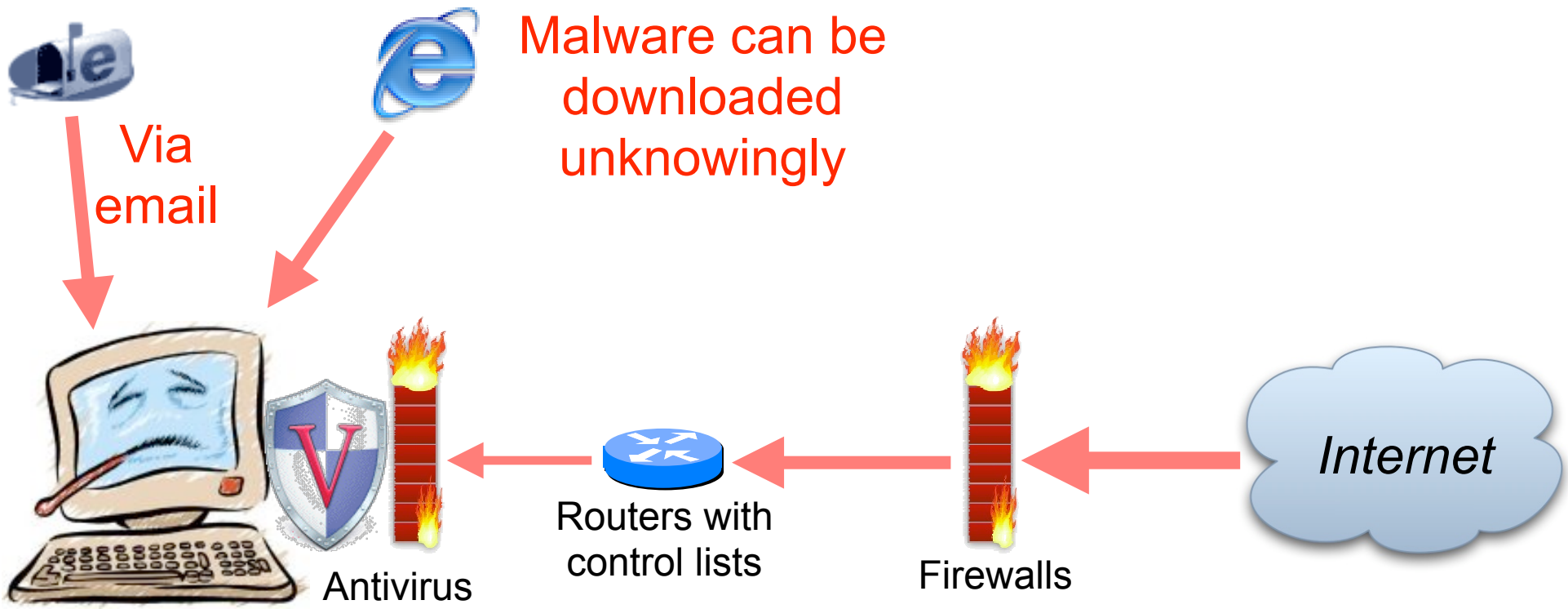
Malware (Malicious Software)



Malware Damages

- $169-204 billion: total damages from malware in 2004 *[mi2g]*
- $300 malware cost per Windows PC, on average *[mi2g]*
- Malware was highest security loss to organizations in 2004 *[FBI/SANS survey]*:
  - $67,000 damages per organization
  - 75% organizations hit by malware attack

Protection?



10 new software vulnerabilities discovered daily

New attacks can evade detection

Spyware

- Spyware: programs that secretly monitor user activities (visited Websites, confidential data, passwords) and reports this data through network
- Often installed secretly:
  - Bundled with freeware
  - Obscure EULA (end user license agreement)
  - Downloaded by malicious Web sites

Spyware (cont)

- Estimated 55-88% PCs are infected by spyware
  - 42% users had no idea how spyware was installed *[Ponemon Institute survey]*
  - Average PC has 25 spyware infections *[WebRoot]*
- 89,806 Web pages found with infectious spyware in first half 2005 *[WebRoot]*

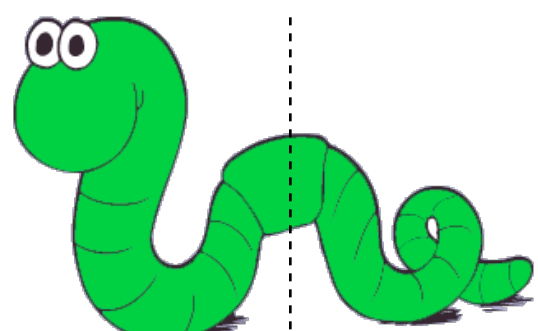
Top Spyware 2004*

Spyware	Behavior	Installation
Purity Scan	Displays pop-ups when user is online	Tricks user by claiming to delete porn
n-CASE	Displays pop-up ads	Bundled with freeware
Claria	Displays banner ads based on surfing habits	Bundled with freeware
CoolWebSearch	Hijacks Web searches and IE settings	Install using malicious HTML applications or security flaws

**WebRoot*

Worms

- Worms are automated self-replicating programs
  - Probe for new targets with vulnerabilities through network
  - Copy themselves to targets



Propagation mechanism | Payload

Worm Propagation

- Most prevalent worms spread by emailing themselves (Netsky, Sober, Mytob)
- Some also spread by peer-to-peer file sharing and instant messaging
- Multiple variants of Cabir, first worm for Symbian smart phones, now seen ‘in the wild’
  - Also seen Commwarrior, first smart phone worm to spread by MMS (multimedia messaging service)

Common Worm Payloads

- Disables antivirus and personal firewalls by killing antivirus processes and deleting critical registry files
- Downloads new code updates from the Internet
- Installs other malware (bots, Trojans, backdoors, keystroke loggers, rootkits)

Trojan Horses

- Trojan horse: programs with hidden malicious functions, or hidden programs
  - Backdoors: allow secret remote access (Sub7, Netbus, Back Orifice)
  - Keystroke loggers: secretly record all user's keystrokes (Bugbear, Lirva worms)
  - Bots: listen for remote commands (spam, denial of service attack) in a 'bot net' (Randex, Spybot, Gaobot)
  - Rootkits: totally 'own' victims

Bots

- 6,361 new variants of Spybot; 1,412 new variants of Randex; 1,121 new variants of Gaobot seen in first half 2005 *[Symantec]*
- Estimated 1-2 million PCs infected with bots *[Honeynet Project]*
  - Largest bot net seen is 50,000 bots
  - 10,866 bots seen active on average day *[Symantec]*
  - 1/3 bots in UK where broadband is commonplace

Rootkits

- Malware of choice: kernel rootkits (Knark, Adore)
- Attackers with ‘root/admin’ access can hack the operating system kernel
- Target PC is totally ‘owned’ by remote attacker
  - Kernel rootkits can be impossible to detect
- Probably an increasing threat in future

Conclusions

- Just a sample of the wild Internet -- it pays to be overly protective
  - Keep antivirus software current and use restrictive firewalls
  - Malware is hard to detect and always evolving
- Our research in automated worm quarantine and use of ordinary traffic controls