Home Computer and Internet User Security

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Quotes to Ponder

Homeland security begins at home.

Various on the Internet

Property has its duties as well as its rights.

Thomas Drummond (1797-1840)

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Goals

Aware – *Understand the issues*

- **Learn about Home Computer Security issues.**

Knowledgeable – *Skills to do something*

- **References contain specific technology examples and checklists.**

Educated – *Foundation for the future*

- **Fundamental issues are highlighted.**

Home Computer Security

Guide to improving the security of your home computer

Technology independent explanation

Examples using Windows 2000

Checklists

http://www.cert.org/homeusers/HomeComputerSecurity/

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Topics

Introduction

Things you should

- know about security
- do to your home computer – tasks
- do when using any computer – practices

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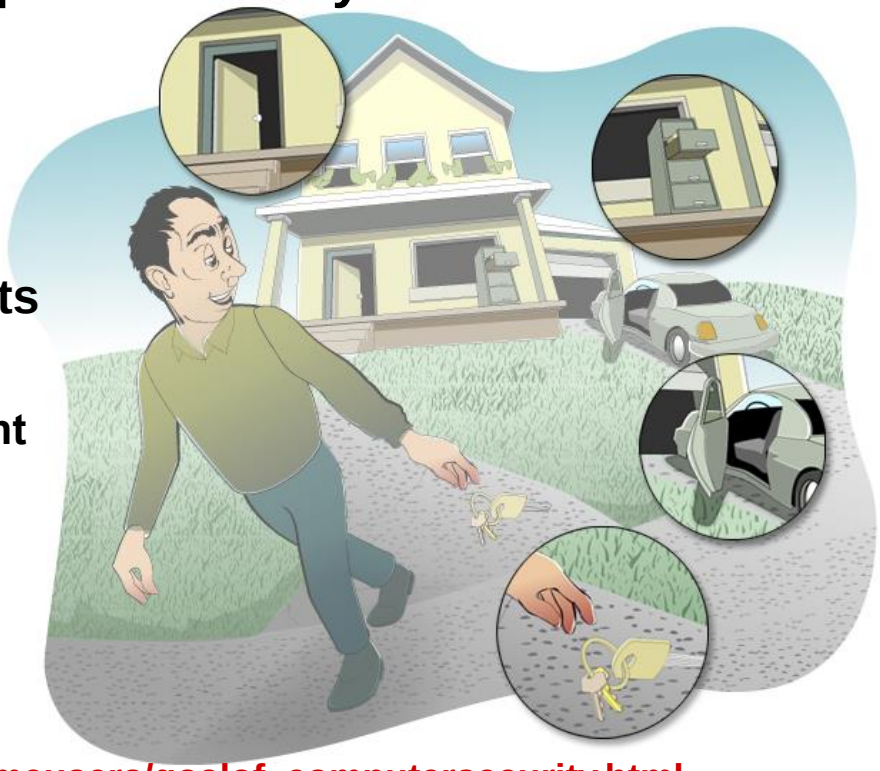
What Problem Are We Solving?

What's yours is yours until you say otherwise!

Keep computer-based possessions yours.

Examples:

- **CPU cycles**
- **memory**
- **disk space and contents**
  - **your files**
  - **software you've bought**
- **Internet connectivity**
- **not a new idea**
- **What locks exist?**
- **How are they used?**



http://www.cert.org/homeusers/goalof_computersecurity.html

Crime on the Internet

Means +

- software or wetware

Motive +

- Anything worth stealing on the Internet?

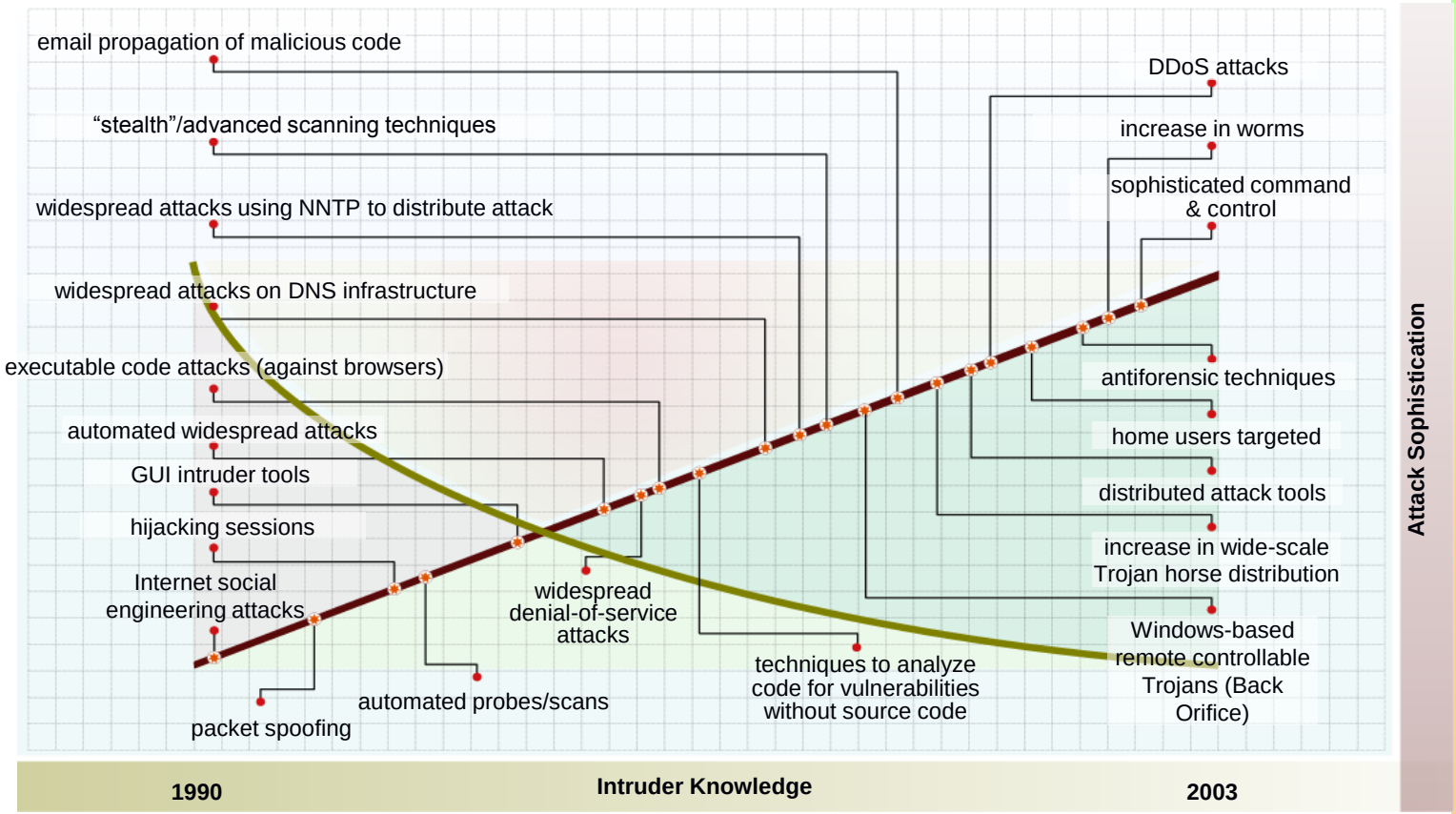
Opportunity =

- Internet access readily available

Internet crime!

http://www.cert.org/homeusers/mmo.html

Attack Sophistication vs. Intruder Technical Knowledge



Why Should I Care?

You are probably either

- **a professional or SA at the office**
- **an owner of a home computer**

Therefore, you are a system administrator!

- **same responsibilities**
- **same tasks**

And, for home computers

- **they are a prime target**
- **because they are less secure**

http://www.cert.org/homeusers/ira_sysadmin.html

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Trust -1

We are trusting by nature.

The Internet is built on trust.

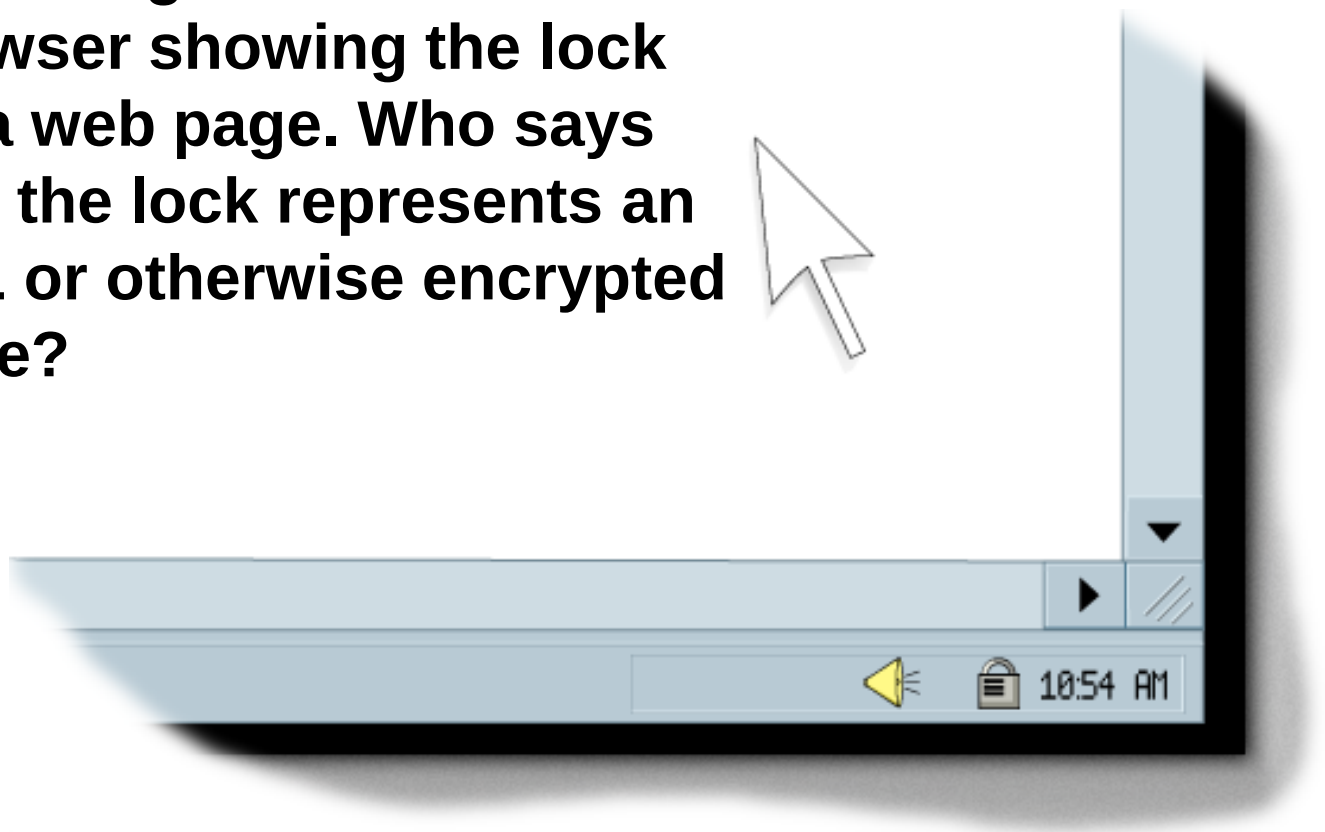
But the world has changed.

Trust by itself is no longer sufficient.

Consider a cereal box.

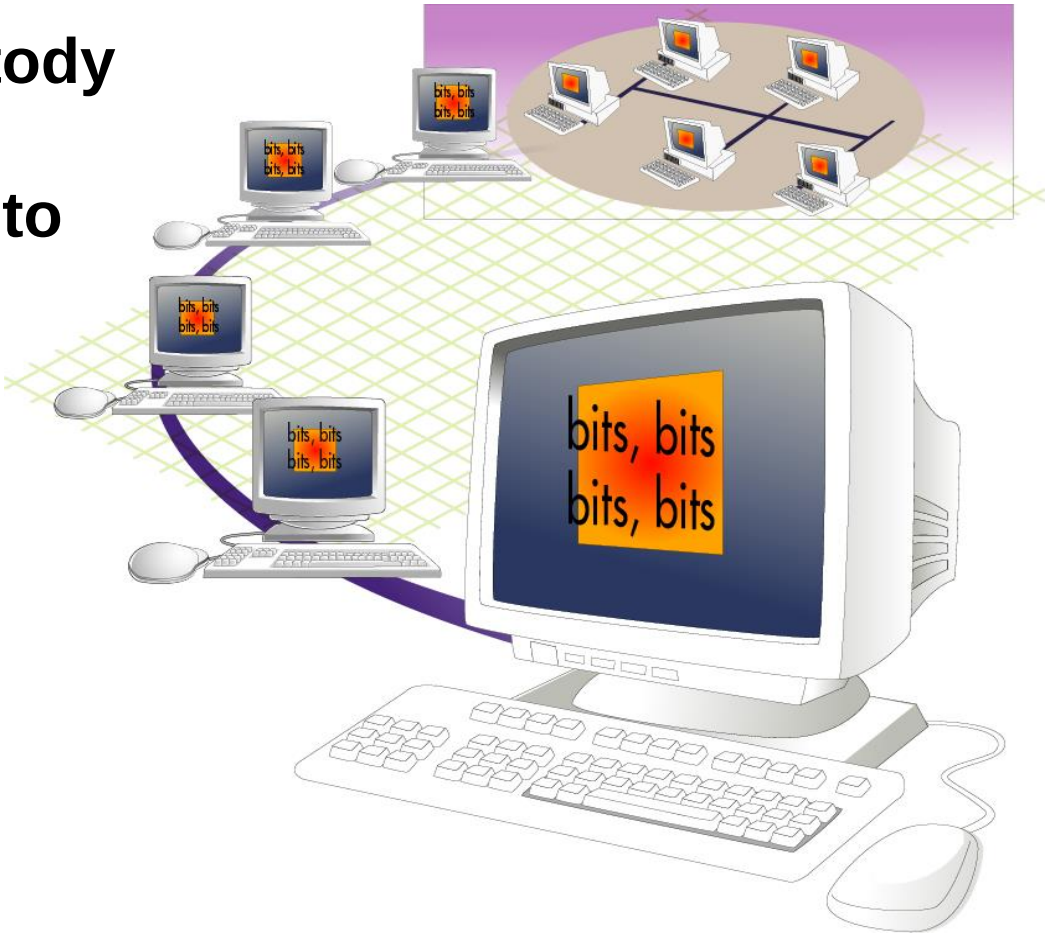
Trust -2

Now imagine a web browser showing the lock on a web page. Who says that the lock represents an SSL or otherwise encrypted page?



Trust -3

Chain of custody of bits, from construction to consumption



Information in the Clear

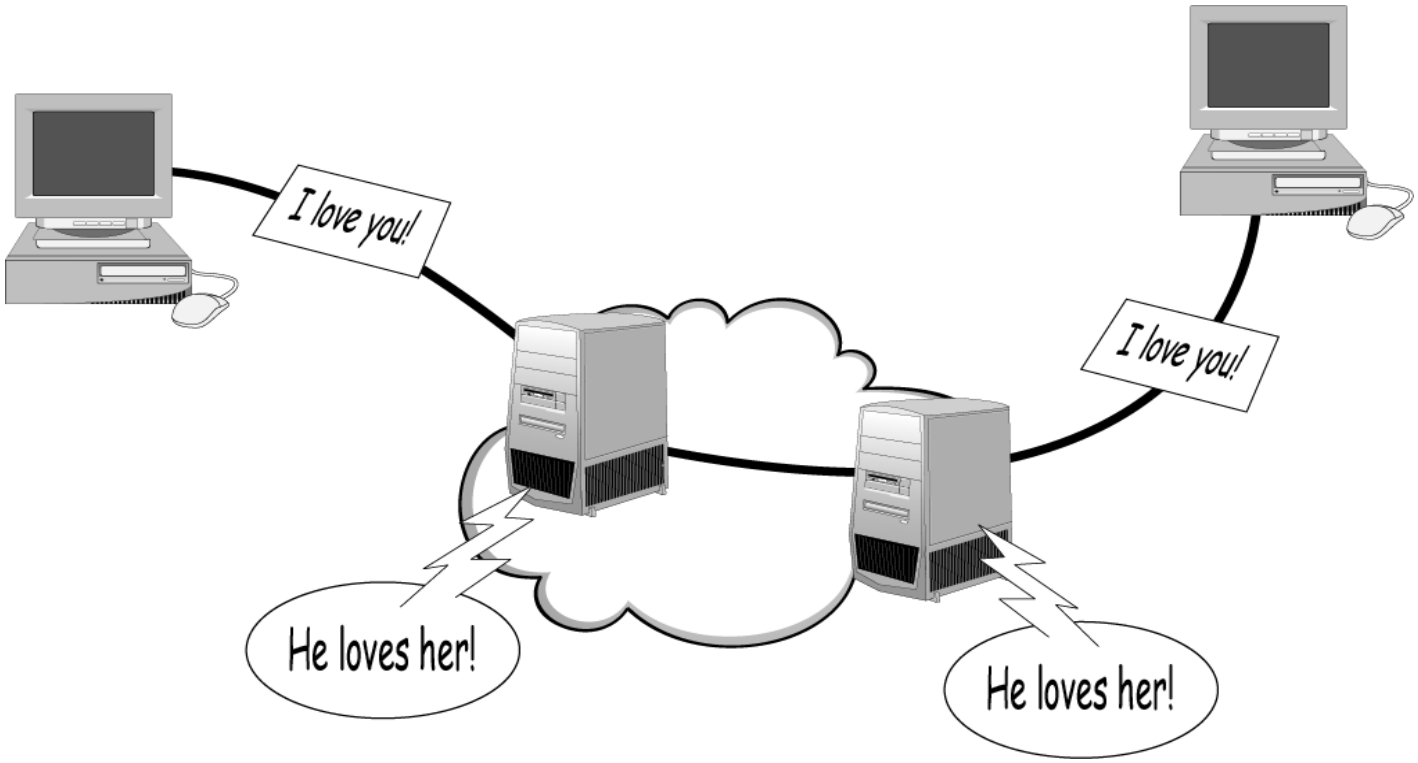
Eavesdropping

Identity theft

Dumpster diving

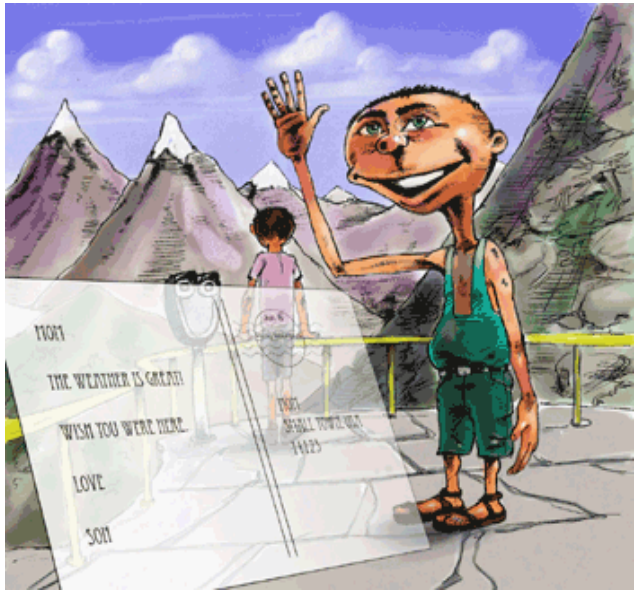
How the Internet Works -1

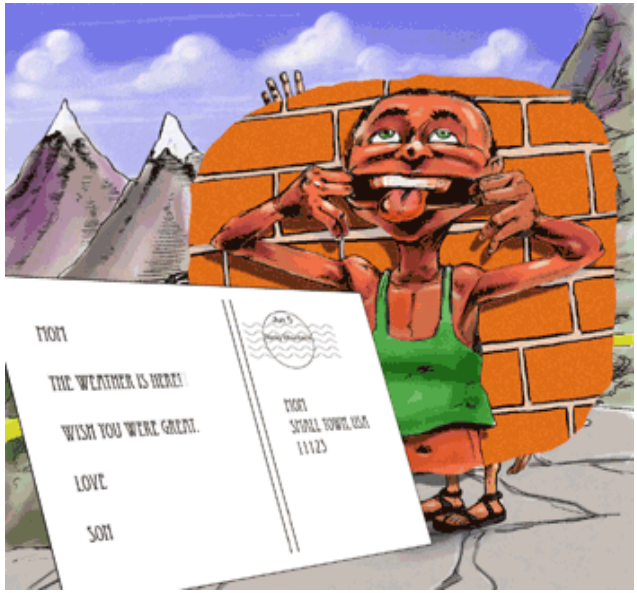
How the Internet Works -2



Email is in the Clear

Email – A Postcard Written in Pencil





http://www.cert.org/homeusers/email_postcard.html

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- do when using any computer – practices

The Nature of Maintenance

All things to "do" are straightforward.

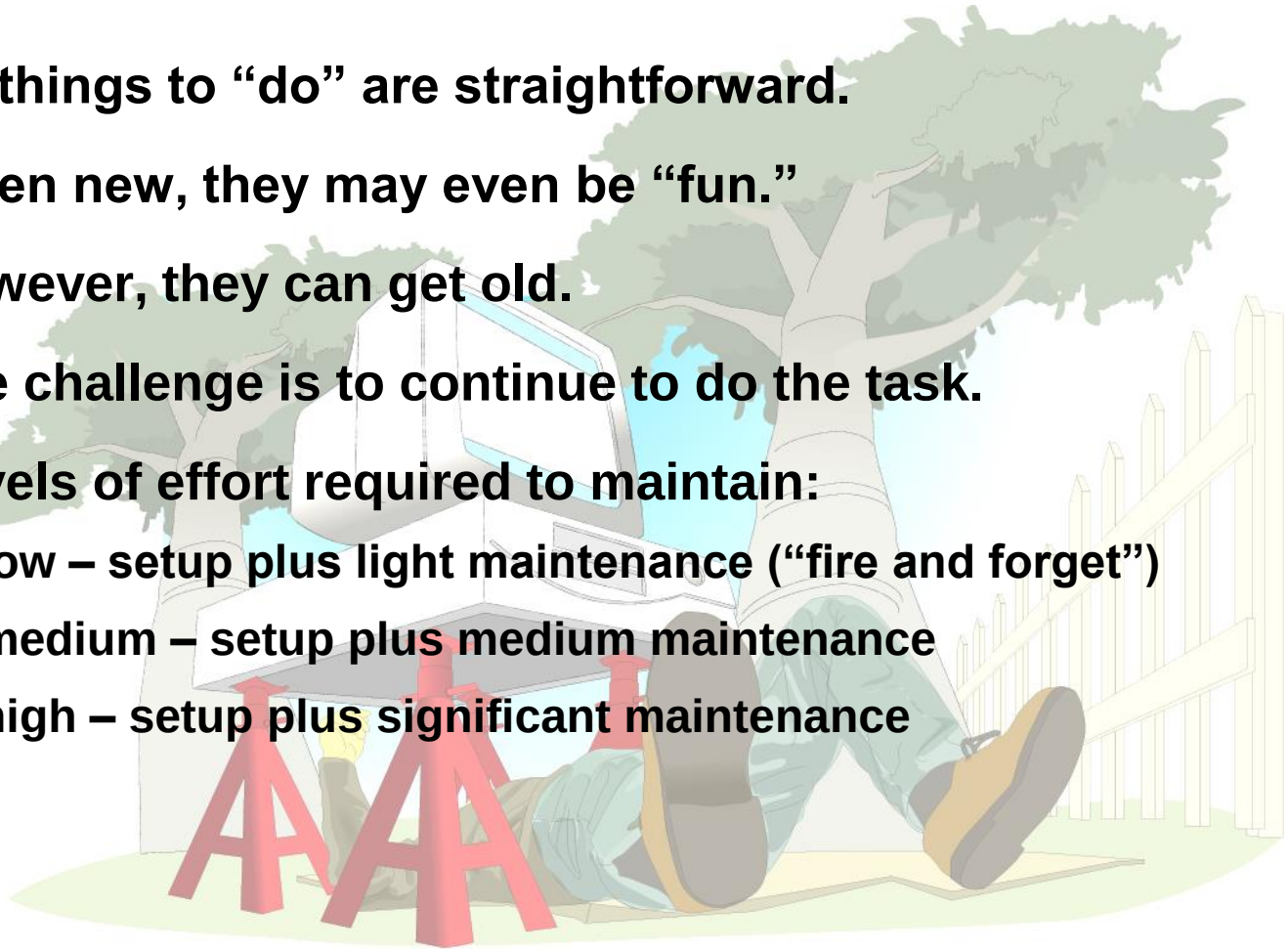
When new, they may even be "fun."

However, they can get old.

The challenge is to continue to do the task.

Levels of effort required to maintain:

- **low – setup plus light maintenance ("fire and forget")**
- **medium – setup plus medium maintenance**
- **high – setup plus significant maintenance**



Task: Install and Use Antivirus Software

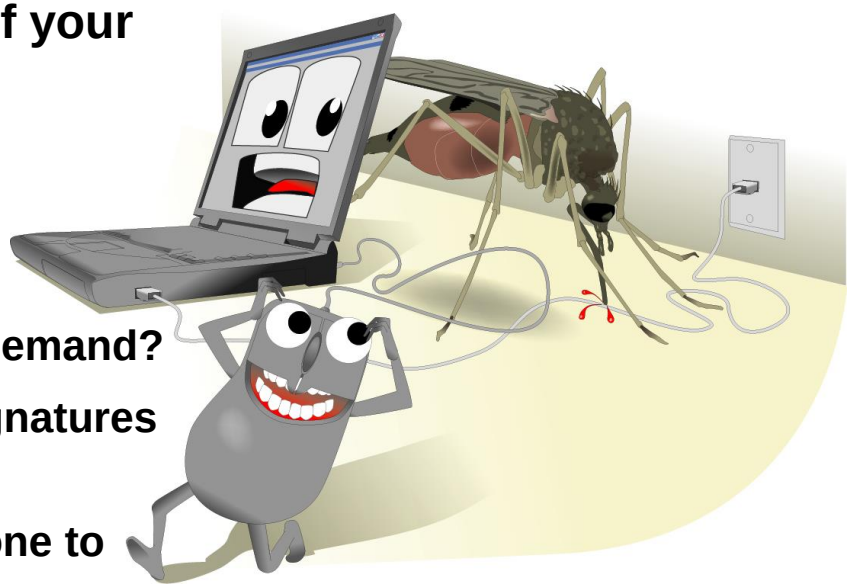
Easy way to gain control of your computer or account

Violates "trust"

DURCH tests

- **Demand – Check files on demand?**
- **Update – Get new virus signatures automatically?**
- **Respond – What can be done to infected files?**
- **Check – Test every file for viruses.**
- **Heuristics – Does it look like a virus?**

Level of effort: low



Task: Keep Your Systems Patched

Unpatched programs are weak spots.

Intruders exploit these to gain access.

ABU tests

- **Affected – Is my system affected?**
- **Break – Does this patch break something else?**
- **Undo – Can I undo patch installation?**

Level of effort:

- **patching: low**
- **what breaks: medium to high**
- **undoing install: medium to high**

Task: Install and Use a Firewall Program

Limit connections to computer

Limit connections from computer based on application

Portable – follows the computer (laptop)

PLAT tests

- **Program – What program wants to connect?**
- **Location – Where does it want to connect?**
- **Allowed – Yes or no?**
- **Temporary – Permanent or temporary?**

Level of effort:

- **install: low**
- **maintain: high**

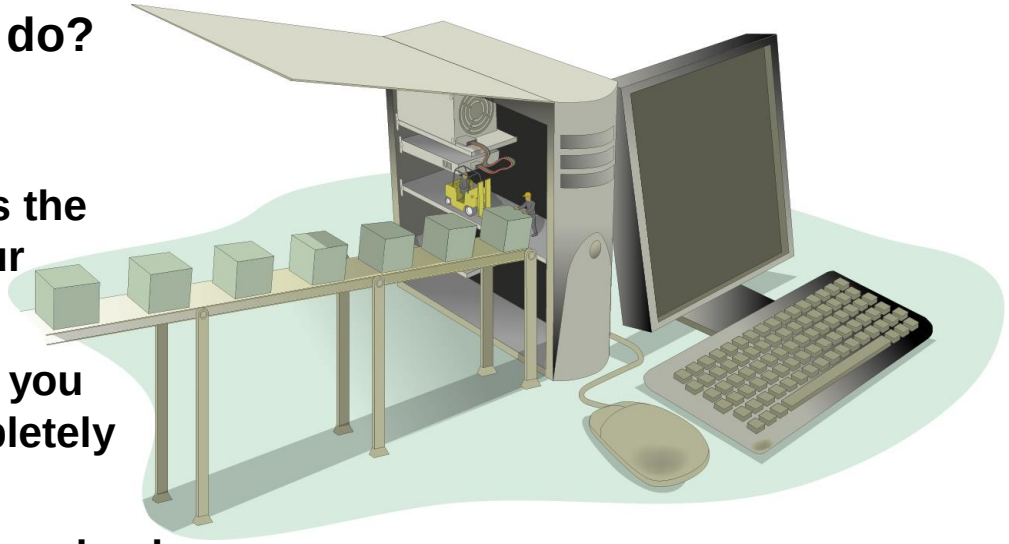
Speaking of Firewalls …

http://www.cert.org/homeusers/HomeComputerSecurity/#4

Task: Use Care when Downloading and Installing Programs

Program may satisfy needs but may harm computer

What does it *really* do?



LUB tests

- **Learn – What does the program do to your computer?**
- **Understand – Can you return it and completely remove it?**
- **Buy – Purchase/download from reputable source?**

Level of effort: high

Task: Install and Use a Hardware Firewall

Guards all computer systems at home

First layer of defense

Fast

Provides logging

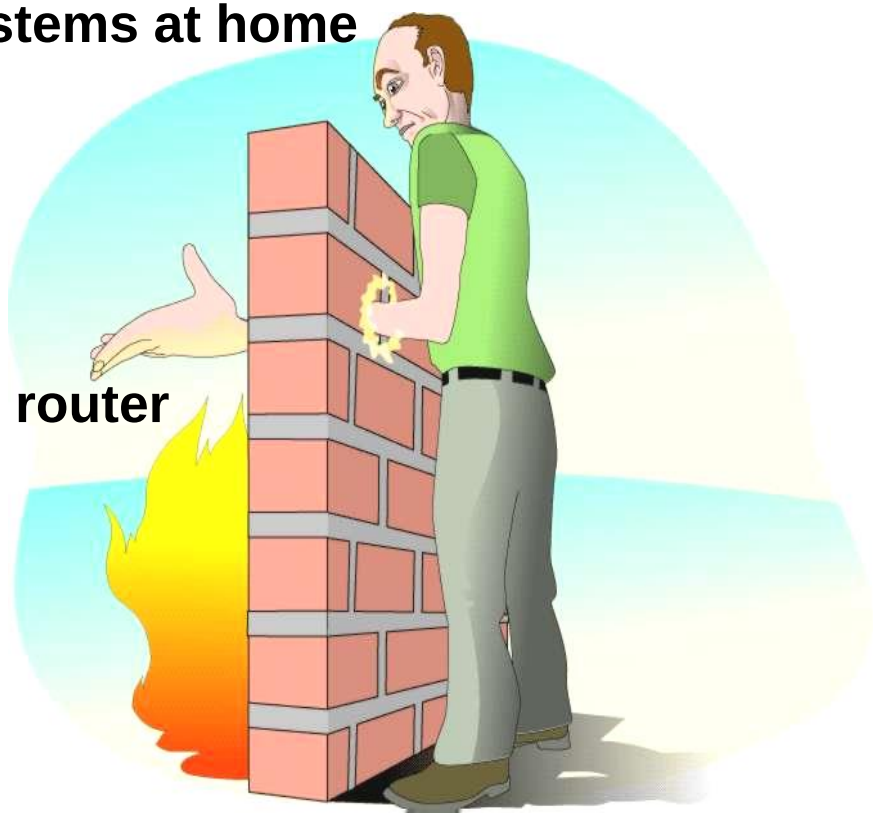
Bundled with cable/DSL router

Bundled with wireless

Default deny setting

Level of effort:

- **install: low**
- **maintain: low**



Tasks Summary

- Install and Use Antivirus Software
- Keep Your Systems Patched
- Install and Use a Firewall Program
- Use Care when Downloading and Installing Programs
- Install and Use a Hardware Firewall

Some easy, some not so easy

All important

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What are Practices?

Practices are steps to follow no matter what computer system you are using.

A home computer is but one instance.

Practice: Use Care When Reading Email with Attachments

Executable content

Interesting to you (social engineering)

Violates trust

KRESV tests

- **Know test – Know the sender?**
- **Received test – Received email before?**
- **Expect test – Did you expect this email?**
- **Sense test – Does this email make sense?**
- **Virus test – Contain a virus?**

Doesn't pass all tests? Don't open!

Level of effort: high

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Using KRESV Tests

1. **Send introductory email (Know)**
   - **ask permission to send attachment**
2. **Qualifies as Received**
3. **If OK, they will then Expect the email**
4. **Subject line needs to make Sense**
5. **Scan attachments for Viruses**
6. **Send the mail**

Level of effort: medium to high

Practice: Make Backups of Important Files and Folders

Can you recover a file or folder if lost?

Does your computer have a "spare tire"?

FOMS tests

- **Files – What files should be backed up?**
- **Often – How often should a backup be made?**
- **Media – What kind of media should be used?**
- **Store – Where should that media be stored?**

Level of effort:

- **setup: medium to high**
- **maintaining: medium**

Practice: Use Strong Passwords

Passwords are like house keys

Different key for each lock

Brute force attacks

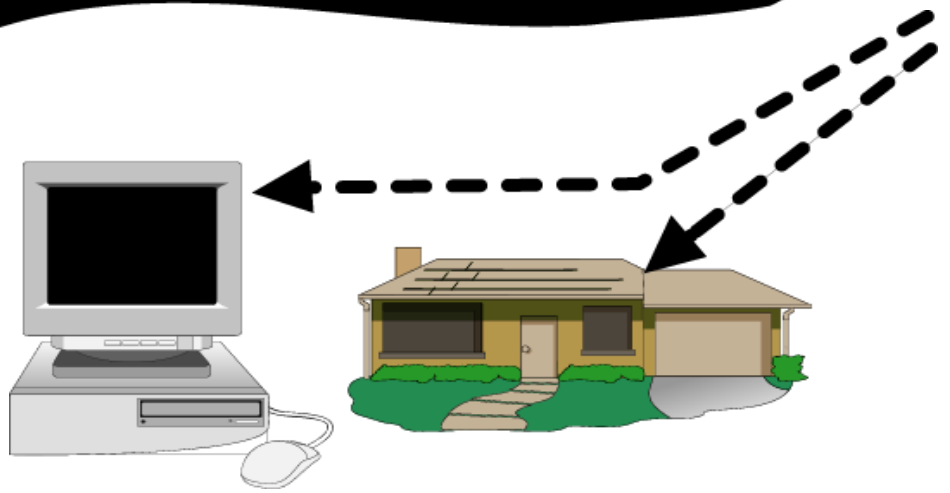
Sniffing clear text

SUPR tests

- **Strong – Password strong (length and content)?**
- **Unique – Unique and unrelated to other passwords?**
- **Practical – Can you remember it?**
- **Recent – Have you changed it recently?**

Level of effort: medium

The Best Protection



Something You Know

Username

Password

PIN

Passphrase

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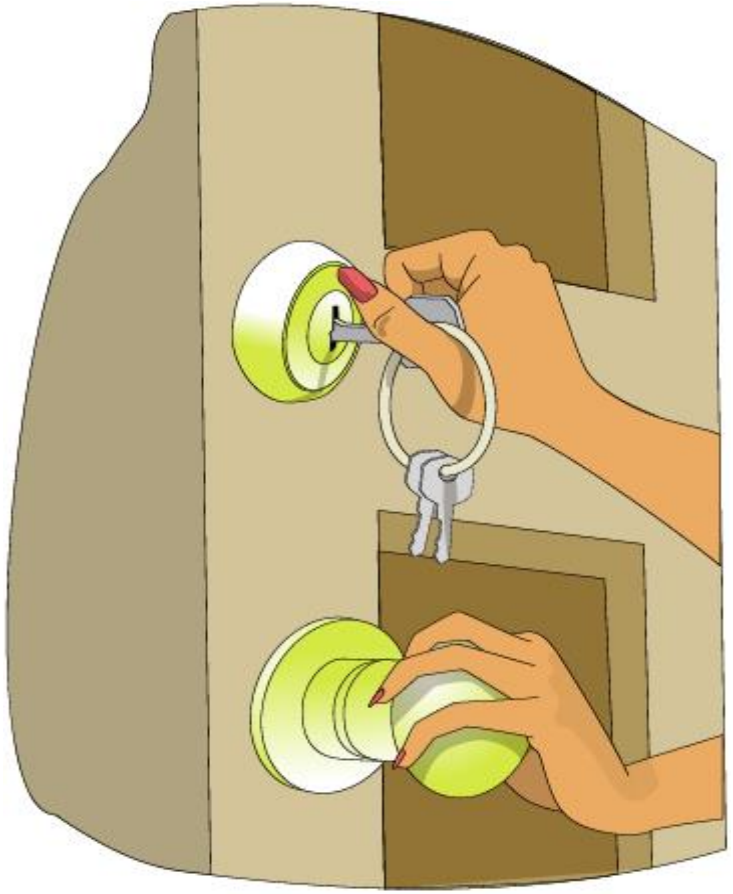
Something You Have

Smart cards

- multi-function

Examples

- national ID card
- driver's license



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Something You Are

Face

Signature

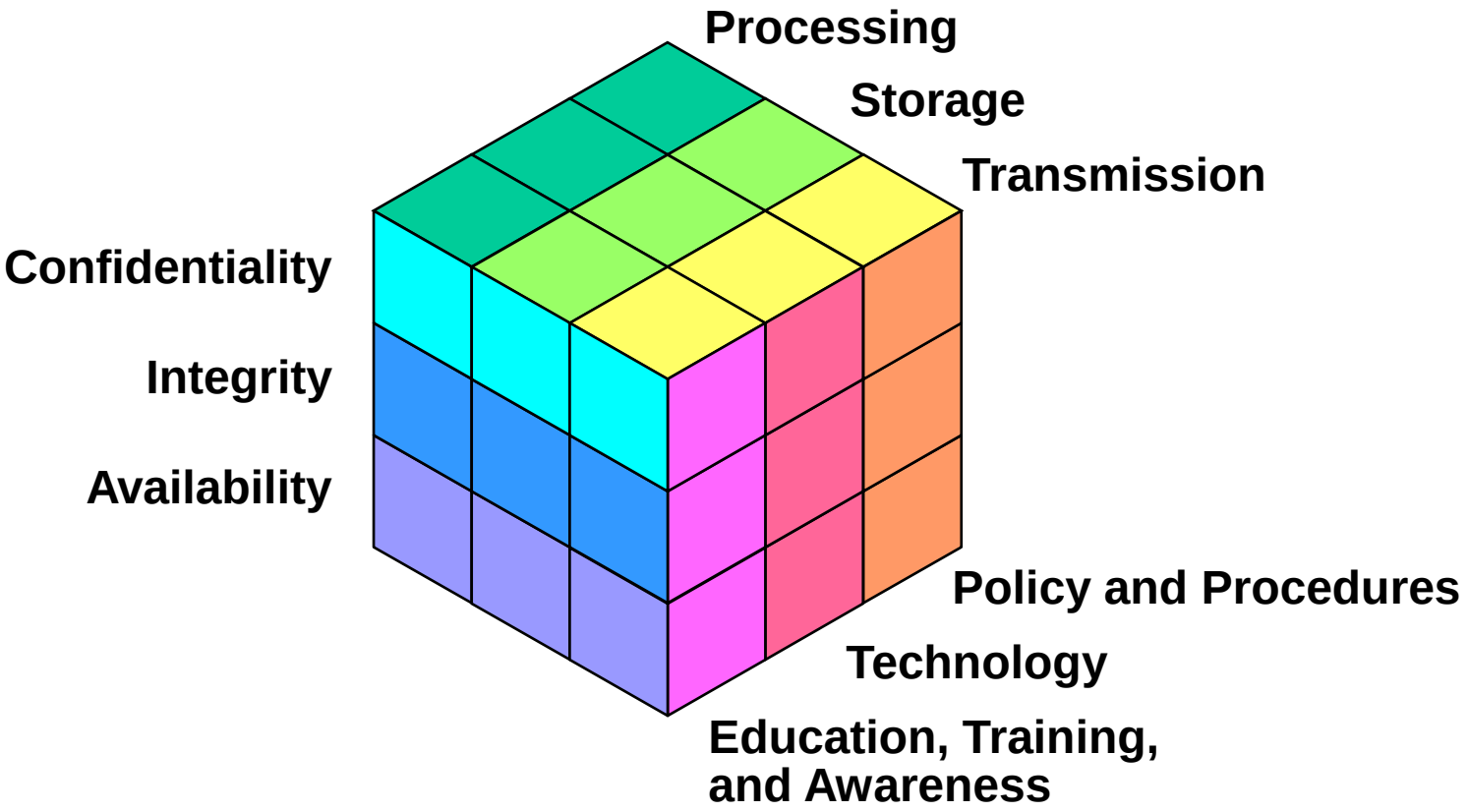
Fingerprint

Retina

Iris

Palm geometry

Information Security Model



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Data Confidentiality – Access

http://www.cert.org/homeusers/piglatin.html

Internet – Friend or Foe?

Example

- **SA posts question to Internet**
- **Gives details of network**
  - **hardware**
  - **software**
  - **applications**
- **Email address and telephone for "quick" response**

What does a potential intruder now know?

http://www.cert.org/homeusers/internet_friendorfoe.html

Data Confidentiality – Encryption

Practice: Install and Use Access Controls and File Encryption

Confidentiality – Need to know only

Limit access to files and folders to only those authorized

Confidentiality of printed information

WAF tests

- **Who – Which users can access?**
- **Access – What kind of access?**
- **Files/Folders – Which need access?**

Level of effort: medium to high

Integrity – Can You Prove It?

Ever get a CD in the mail, at home or in the office?

How do you know where it came from?

How do you know what it contains?

What should you do with it?

http://www.cert.org/homeusers/prove-it.html

Practices Summary

- Use Care When Reading Email with Attachments
- Make Backups of Important Files and Folders
- Use Strong Passwords
- Install and Use Access Controls and File Encryption

Things you do everywhere

Some easy, some not so easy

All important

Knowledge – Apply to Wireless

Confidentiality

- Cannot limit access to airwaves.
- This means encryption (WEP).
- But WEP is weak.
- So use VPN or WAP.
- Disable SSID broadcasts.

Access control

- Use MAC address filtering.
- But MAC addresses can be spoofed.
- So use 802.11X for user identification.

Is There an Intruder in My Computer?

Normal

- What's normal behavior?
  - running programs
  - network traffic
  - performance
  - operating system
- hard to do
- vendors don't help

Abnormal

- need to know what normal is first

Level of effort: high

http://www.cert.org/homeusers/intruder_in_computer.html

There IS an Intruder in My Computer – What Now?

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Questions to answer:

1. **What changed?**
   - **What was there before?**
   - **How did it look?**
2. **How did they get in?**
   - **specific files changed**
3. **Why did they get in?**
   - **missing patches**
   - **out-of-date virus list**
   - **no firewall**

Level of effort: high

http://www.cert.org/homeusers/intruder2.html

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Questions?

References

The "Larry" Stories
(http://www.cert.org/homeusers)

Home Computer Security Guide
(http://www.cert.org/homeusers/HomeComputerSecurity)

Before You Connect a New Computer to the Internet
(http://www.cert.org/tech_tips/before_you_plug_in.html)

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