How Hacking Effects Everyone's Life
and
How to Protect Yourself from Hackers

Hampton University
January 22, 2009

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We Face New Choices
A threat is any agency, malicious or otherwise, that can have an undesirable effect on the assets and resources associated with a computer system or network:

- Natural Disasters
- System and component failures
- Accidents and mistakes
- Organizations or individuals who both intend us harm and have the capability to accomplish their intentions
  - Computer hackers, criminals, industrial or state-sponsored spies, enemy armed forces, terrorists, psychotics, drug lords or saboteurs
Malicious Threats

• Confidentiality
  – Theft of secrets
    • National security threats
    • Trade secrets

• Integrity
  – Identity theft

• Availability
  – Denial of service
  – Destruction of assets

• Malicious code
• Masquerading
• Social engineering
  – Phishing
• Covert channels
• Van Eyck radiation
• Poisoned pages
• Clickjacking
• Botnets
The Threat Model

Threat → Vulnerability → Access → Impact

- Natural
- Human
- Reducible
- Inherent
- Confidentiality
- Integrity
- Availability
- Negligent
- Malicious
- Willing
- Able
- Knowledge and Skills
- Technology
Protecting Yourself, Your Family and Your Organization
In a perfect world, starting from scratch and with infinite time and resources:

- Benchmark system capabilities, enterprise operations, policies and procedures
- Perform a vulnerability assessment, taking into account standard operating procedures and any countermeasures
- Create an enterprise vision for security:
  - What should be protected?
  - How long should it be protected?
  - How strongly should it be protected?
- Implement a comprehensive risk management program
  - Protect, detect and correct
But!
  - this isn’t the perfect world, and you’re not starting from scratch, and you don’t have infinite resources

You need cheap, simple and effective security
  - A short list of things that you can do right now
  - That are effective -- these really work!
  - That are inexpensive

Why?
  - To deter all but the most dedicated of opponents
  - Buy time to put a more comprehensive security program in place

• What information assets and systems need protection? How much protection do they need? How long must protection be continued?

• Good information security is more than computer and network security. It requires a balanced mix of security practices and procedures.
Have Good Passwords

- Self-chosen passwords are inadequate
  - Many are easily guessed
  - Any word in the dictionary is recoverable
  - Hackers can recover most self-chosen passwords in a few minutes
- Complex passwords are better
  - Combinations of symbols and cases
  - Need to be changed regularly
  - Still vulnerable to sniffers
- One-time passwords are best
  - Token-based (time-synchronized or challenge-response)
Use Good Antiviral Products

- Insist on having good antiviral software on all workstations and servers
- Update your antiviral software frequently
- Teach your people about the dangers of bringing in software from home
- Test all media off-line before letting them be put into a workstation connected to the network
- You may need to use more than one antiviral product
Implement a Patch Management Program

- CERTs maintain lists of known vulnerabilities
- CERTs supply patches to close known vulnerabilities
- A robust patch management program ensures that you are not vulnerable to known attacks
Use Good Cryptography

- Very good cryptographic systems are available
  - Symmetric systems like Rijndael (AES), triple DES or IDEAS
    - Require secure key management
  - Public key systems
    - Require trusted Certificate Authorities
- Long keys are essential
  - Single DES key spaces exhausted in 79 hours with an investment of less than US$ 250,000
  - 168-bit key lengths now exportable from the United States
Have Good Firewalls

- Firewalls protect information as it enters and leaves your organization
  - Firewalls are not sufficient protection by themselves
  - Cryptography is needed to protect your communications with the outside world
  - Auditing and good security practices are needed to protect you from insiders
- Firewalls range from unsophisticated packet filters to complex rule-based systems, so choose the level you need based on sound risk management
Have a Good Backup System

- Backup your information systems frequently
- Store your backups securely offsite
- Remember that you don’t need to save everything forever

- If you are in a time-critical industry, you may need to have a mirror site (beta site) capable of assuming operational responsibility in an emergency
Audit and Monitor the Use of Your Systems and Networks

• Make sure your employees know that they have no expectation of privacy when they use your systems

• Enable auditing on your systems and networks

• Have a system that helps you analyze the audit logs
  – Immediate alerts on security-relevant activities
  – Statistical analyses to establish norms
  – Alerts on variations from norms
Have a (Good) Training and Awareness Program

- Training and awareness is needed at all levels of the organization
- Training and awareness is your best line of defense against
  - Introduction of viruses and other malicious code
  - Penetration by fraud ("social engineering")
- Training and awareness must be repeated
  - Remind people who have already taken it once
  - Keep awareness level high
  - Train new people
  - Maintain expectations of actions and duty
Test Your Security Frequently

- Analyze your systems for vulnerabilities
  - War-dial your facilities to detect unauthorized modems
  - Use SATAN or other testing products
- Test the security features of your systems and networks
  - Ensure that the latest patches have been incorporated
- Perform penetration testing
  - Technical penetrations
  - Social engineering
- Use outside experts for testing
Have Contingency Plans In Place

- When the crisis is occurring, it’s too late to start planning how to handle it
- Have a properly trained and equipped CERT team standing by
- Have strategic alliances already developed
  - Lobbyists
  - Public relations
  - Security experts
- Make sure your people know what they have to and need to do
- Practice, practice, practice
Elements of a Comprehensive Security Program

- Review your security policies, practices and procedures
- Have good passwords
- Use good antiviral products
- Implement a Patch Management Program
- Use good cryptography
- Have good firewalls
- Have a good backup system
- Audit and monitor the use of your systems
- Have a good training and awareness program
- Have contingency plans in place
- Test your security frequently

Remember: Good security doesn’t have to be expensive!

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Thank you!

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