Pretty Good Privacy

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Why?

• What can we use cryptography for?
• Why would we bother?
• What are the implications of not using it?
Public Key Cryptography

- Create a public/private key pair
- keep the private key private
- make the public key public
- Use someone else's public key to encrypt data such that only they can decrypt it, using their private key
- Use your own private key to sign something in a way that anybody who has your public key can verify
T rusting Public Keys

• If you want to use someone's public key (for what?) it's important to trust that the copy you have is accurate

• How could you tell?
Keeping Private Keys

Private

• How much trouble should you go to?
• How private is private?
  • how secret is secret?
Remember!

• You are creating keys on extremely insecure public servers

  • "afnog/afnog"

• Don't share anything that is *really* secret

• Delete your keys (public and private) when you are finished. Why?
1. SSH
SSH in Practice

- SSH supports password authentication as well as key authentication. Which is better? Why?
  - SSH scanners on the Internet
- Distributing public keys
  - SSHFP records in the DNS
  - Trust on First Use (TOFU)
- Keeping up-to-date
  - Frequent enough vulnerabilities in ssh, historically, to be careful
  - OpenSSH has a great track record in responding to vulnerabilities
Exercise

- Create a key pair on your SSH client (find out how)
  - set a passphrase to "success!"
- Transfer public key to your server
- Confirm that you can connect using ssh to your server without using a password
- Turn off password authentication on the server
2. PGP
PGP in Practice

- PGP at the command line is a bit ugly
- There are plugins for mail clients to make all of this easier
  - Thunderbird
  - Mutt on the Unix/Linux command-line
  - MailMate, Apple Mail on the Mac
  - Surely something for Windows
- Web mail clients are harder. Why?
Exercise

• Install GnuPG

• Create a key pair

• Obtain public keys from other people in the room

• Find ways to trust their public keys

• Encrypt a private message to another person, and verify that other people can't easily decrypt it