Considerations and Resources for Practical Security

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what to expect

- a lot of this presentation is humorous
- real references at the end
- security is incremental
- perfect is the enemy of getting better

what this is not

- not about physical security
- not a tutorial
- not what to do if the FBI, CIA of FSB is after you

what we will cover some important security problems

- passwords

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- ssh keys
- file security

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- mobile/wifi

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- I designed the curriculum for the High School for NSF/NSA Cybercamp at John Jay

password problem

- different for each entity
- longer is better
- random is better

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- humans need help

What we all think

What about a really good password

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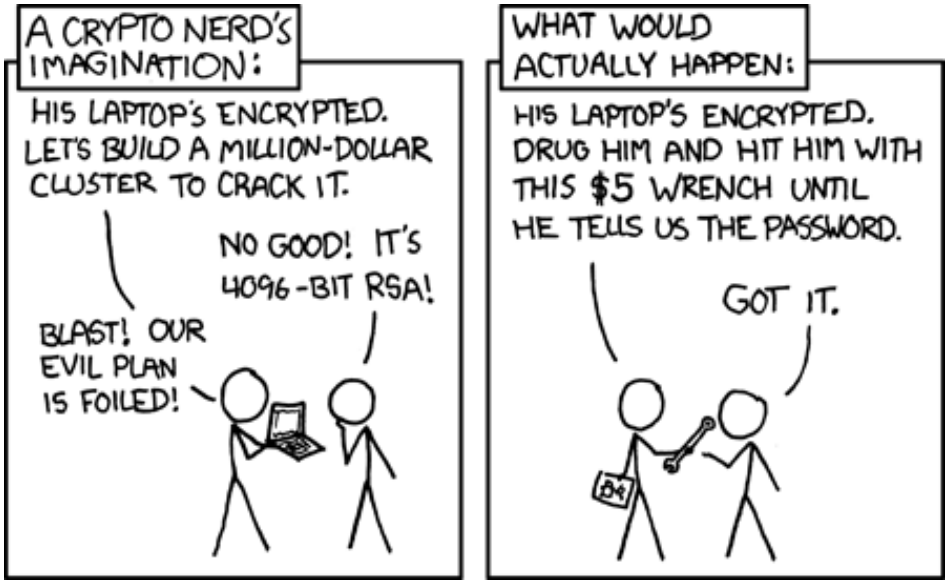
or with a nerd's imagination



terrible implications

terrible implications

One more problem

- I will show you the solution I use
- But there is one more problem

too short

A small slide-show from intel on passwords

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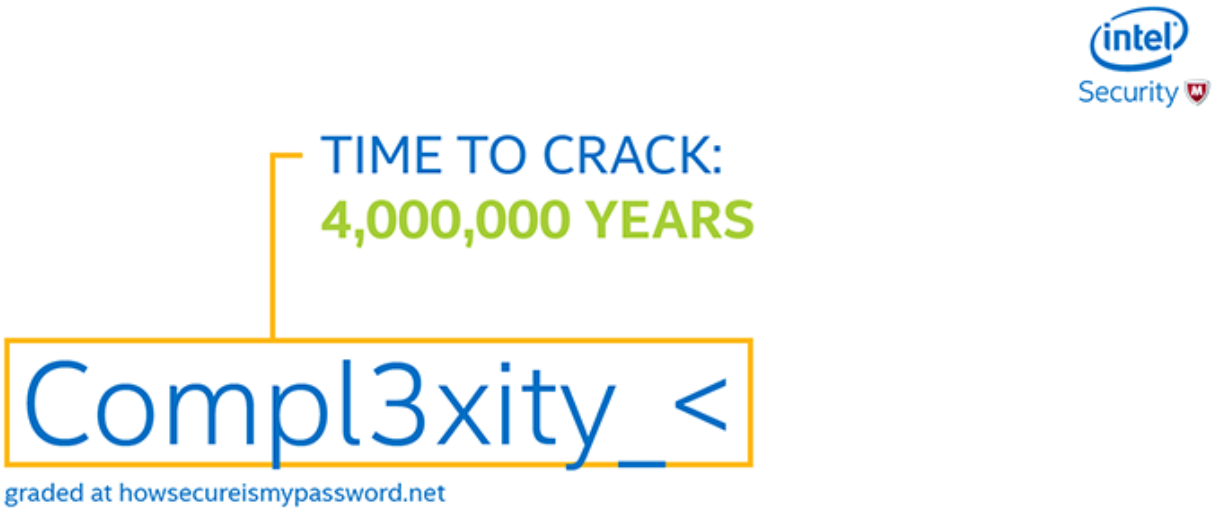

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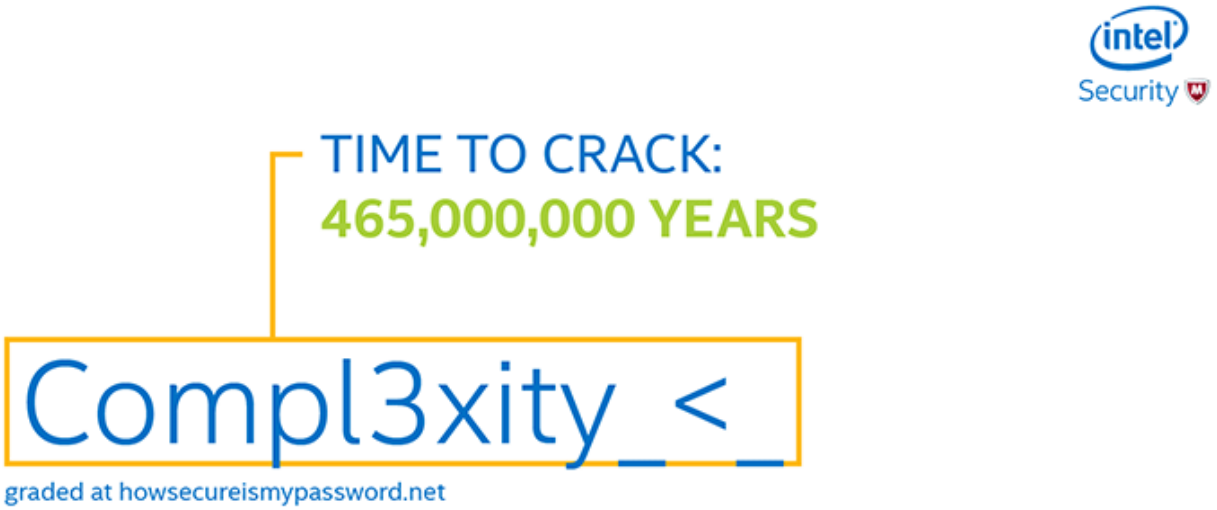

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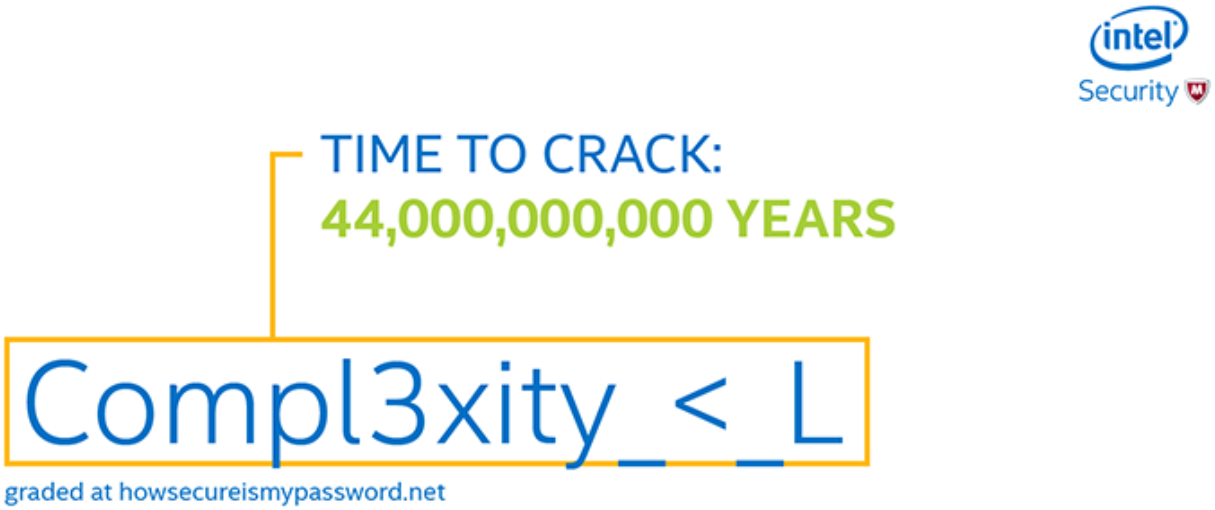

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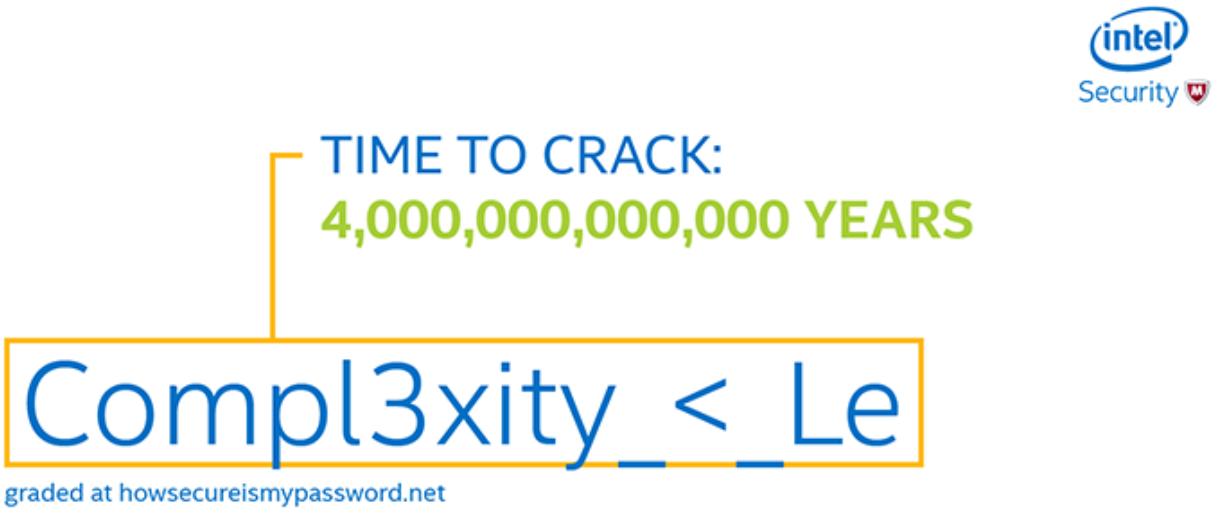

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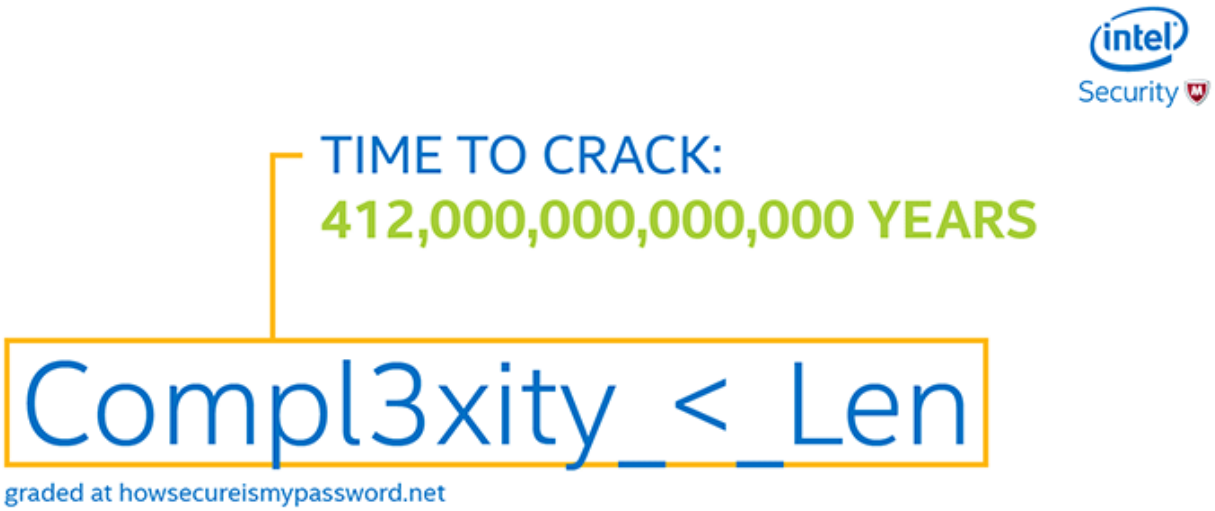

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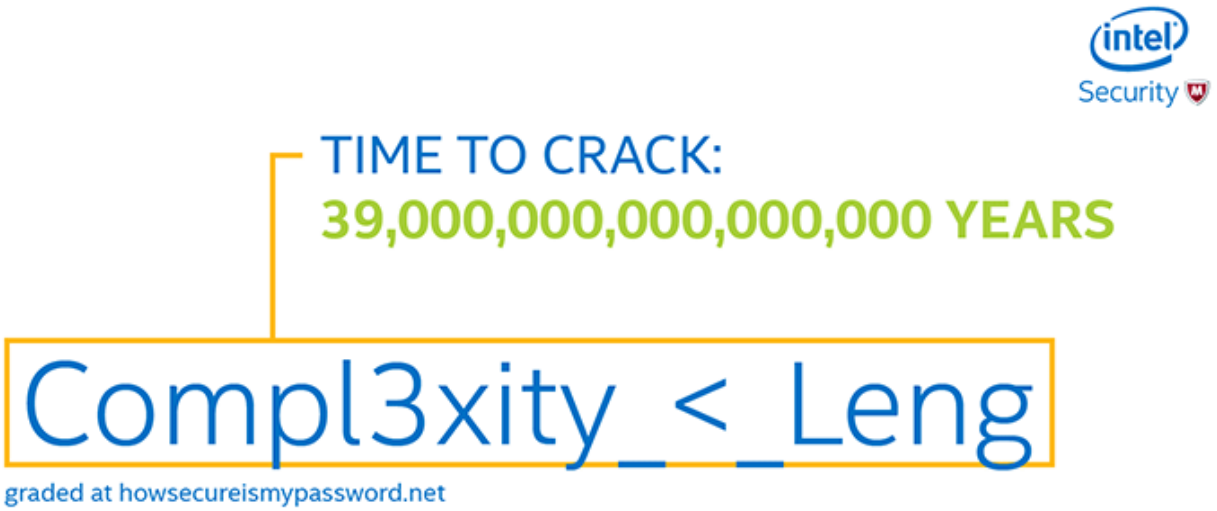

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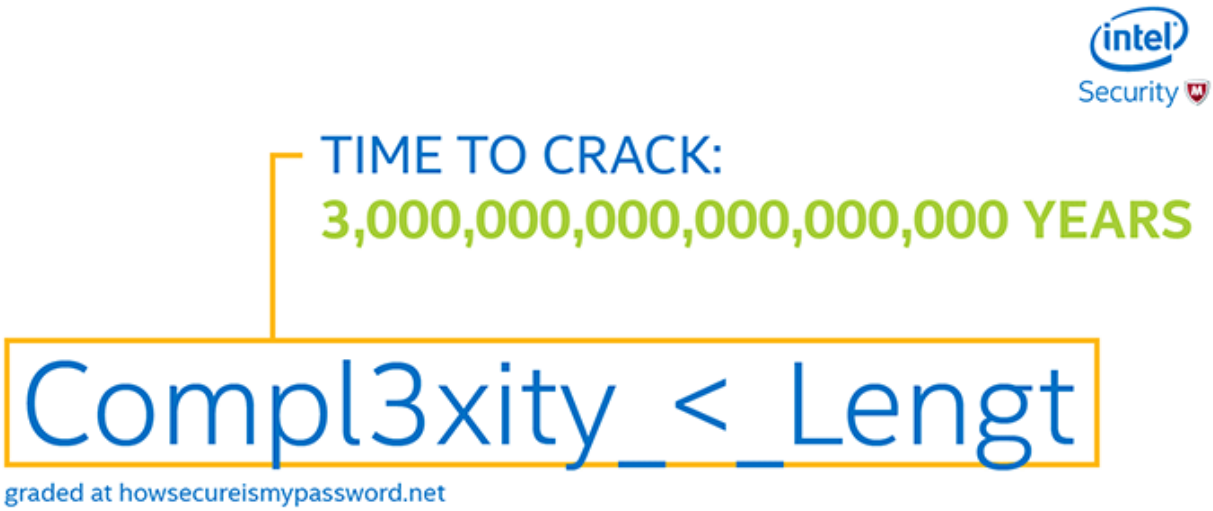

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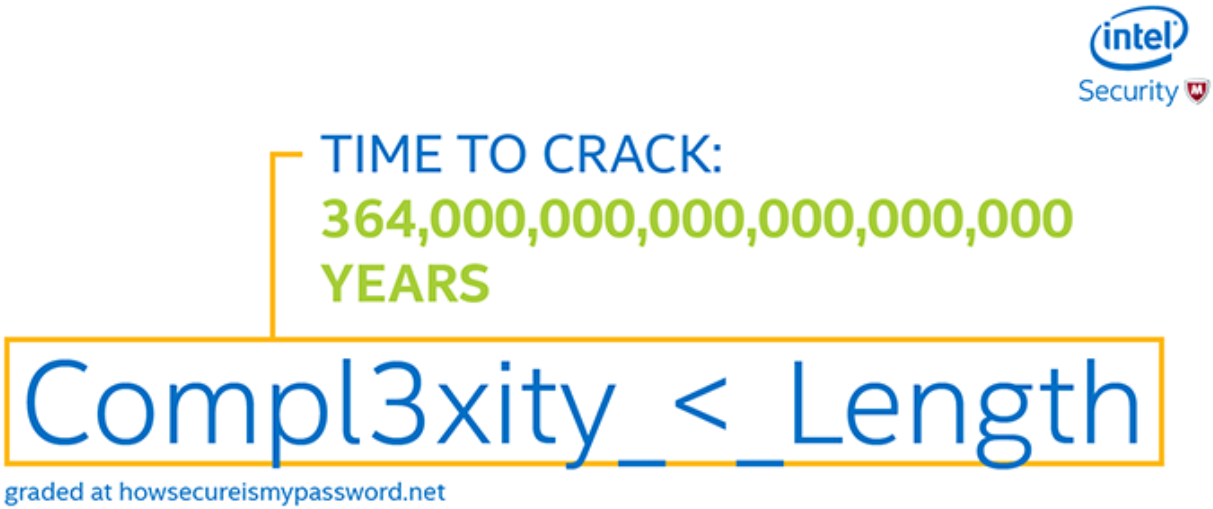

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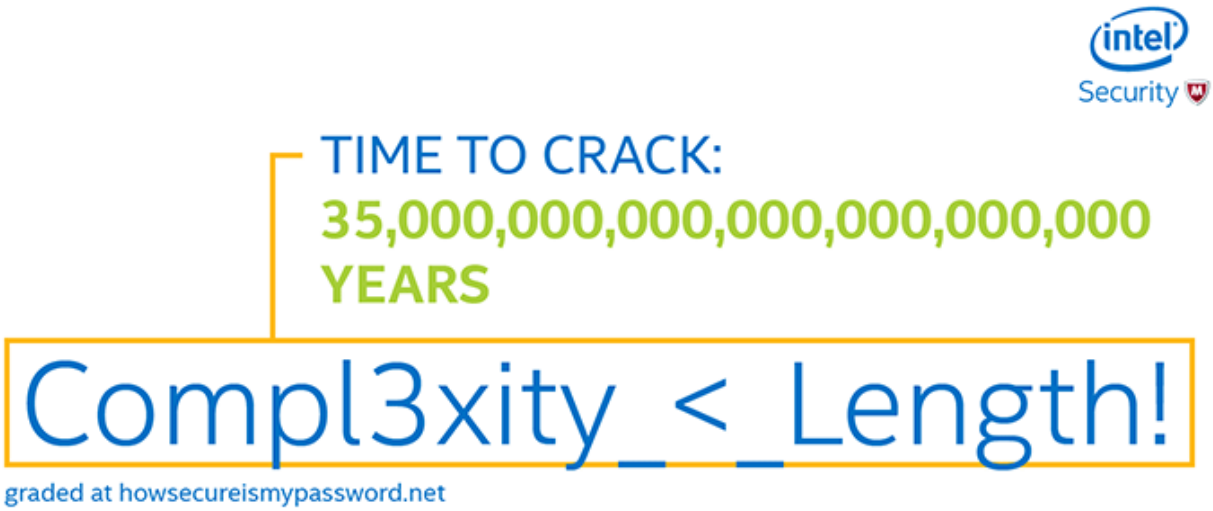

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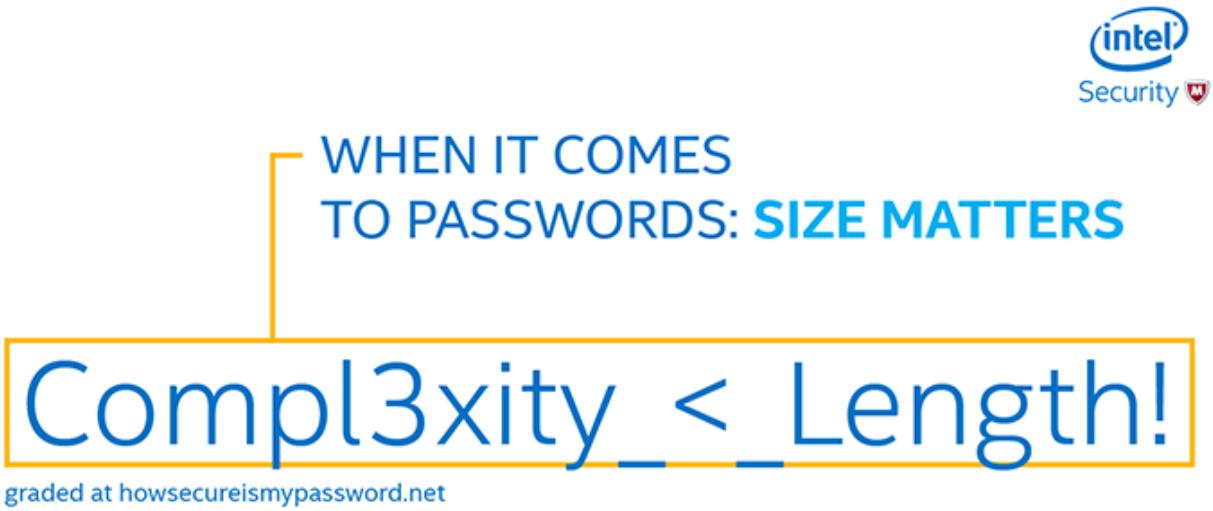

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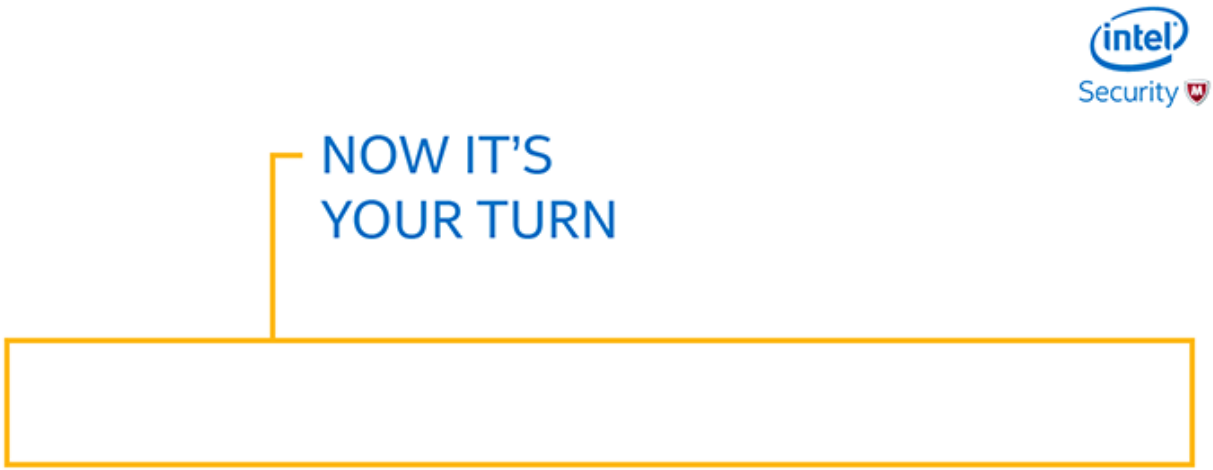

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#PASSWORDDAY

So the problem for IT

So how does everyone do it?

Tutorials on ssh keys

- OS X and Linux
  - Search: standard unix password manager
  - `https://www.passwordstore.org/`
- Windows
  - Search: keeper
  - `https://keepersecurity.com/personal.html`

How a password manager works

- one very strong password
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- Don't lose your laptop

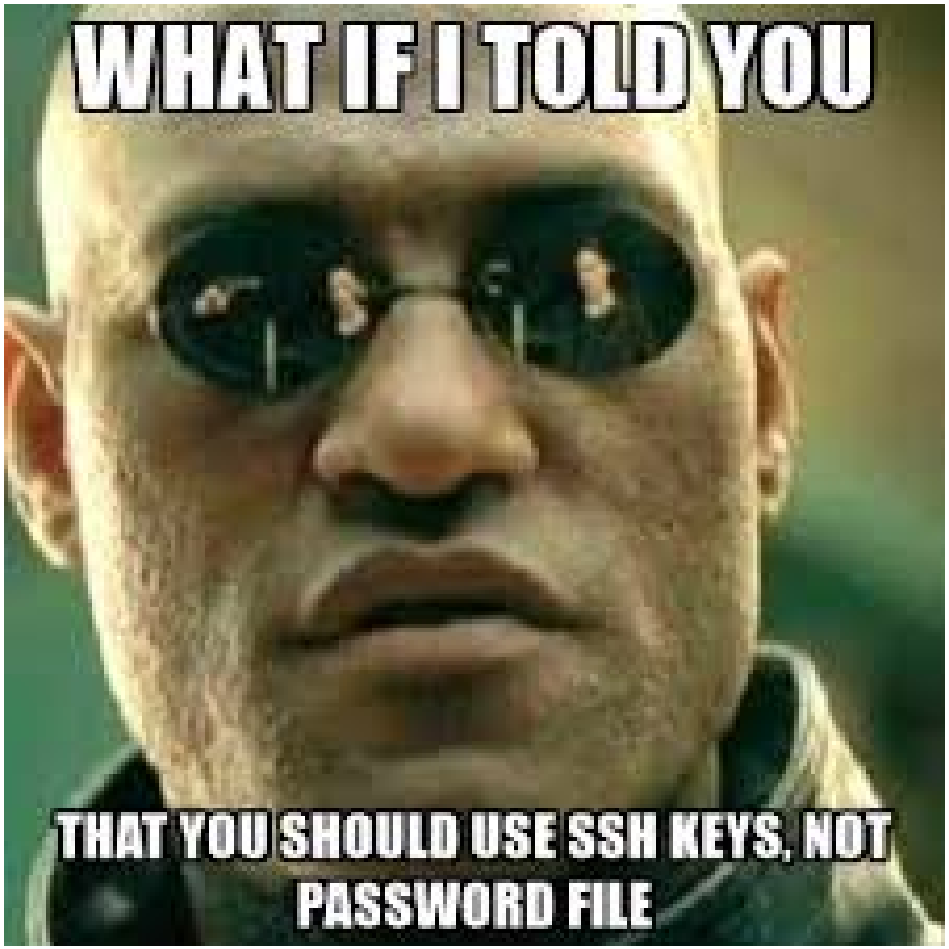
Keys

- ssh keys are a pair of two large numbers
  - call one: public
  - call the other: private
    - that multiply to a very large number
- That very large number is only divisible each of these
- It is equivelent to a 670 random character password

Tutorials on ssh keys

- OS X
  - Search: osx generate ssh keys
  - `https://help.github.com/articles/generating-a-new-ssh-key-and-adding-it-to-the-ssh-agent/`
- Windows
  - Search: windows generate ssh keys
  - `https://www.digitalocean.com/community/tutorials/how-to-use-ssh-keys-with-putty-on-digitalocean-droplets-wi`
- Linux
  - Search: ubuntu generate ssh keys
    - `https://help.ubuntu.com/community/SSH/OpenSSH/Keys`

So


WHAT IF I TOLD YOU
THAT YOU SHOULD USE SSH KEYS, NOT PASSWORD FILE

And now:


YOU GET AN SSH KEY
AND YOU GET AN SSH KEY
EVERYBODY GETS AN SSH KEY

But of course:

File security

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  - The encoded file is called *Ciphertext*

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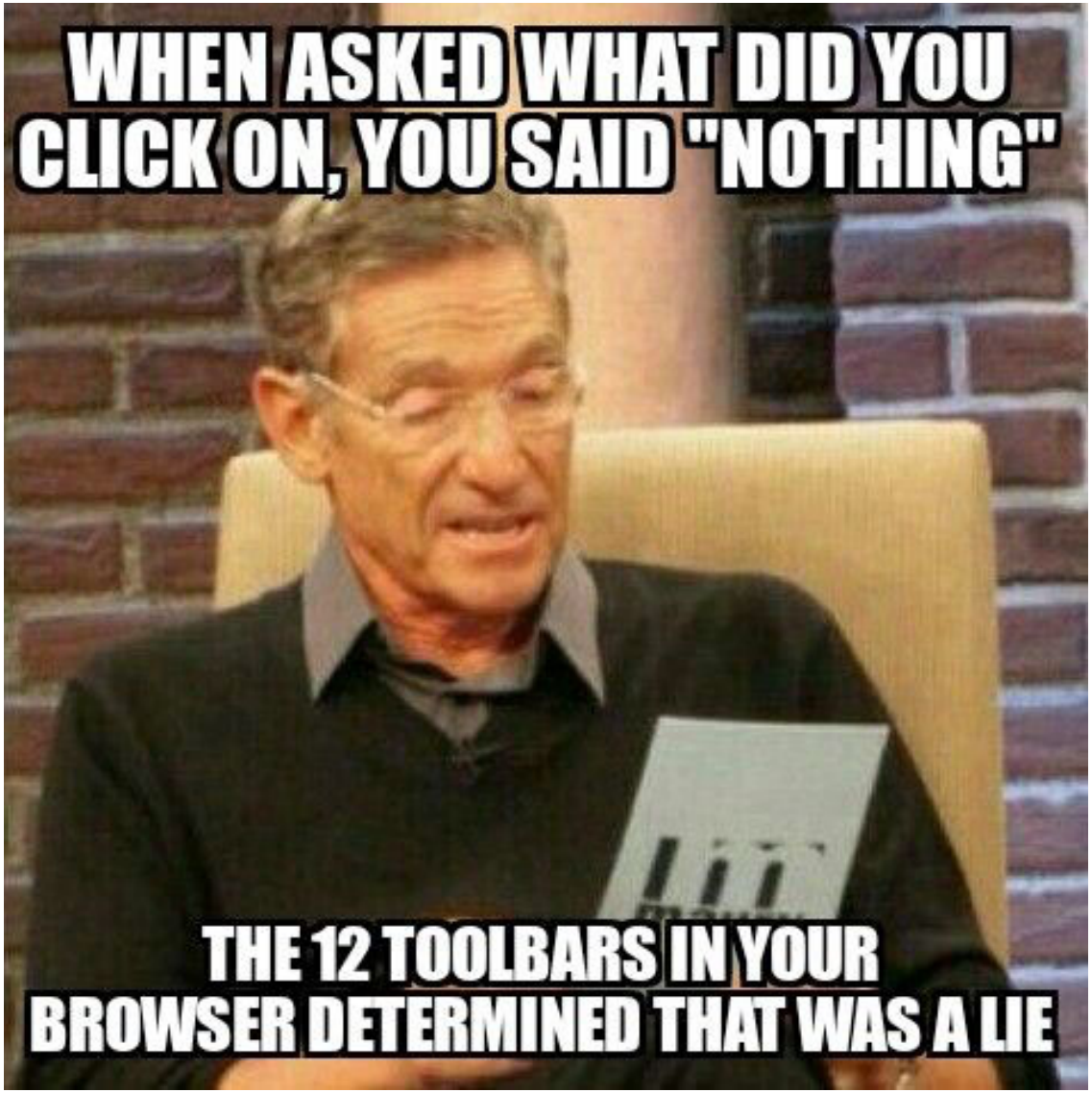
- search: gmail encrypted email
  - `https://support.google.com/mail/answer/6330403?hl=en`

Basic email security



Check before you click

1. Did this come from someone you know?
2. What is file extension?
   - don't click on anything that "pdf.exe", "docx.exe", "pptx.exe"
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1. Do not ever watch porn on a computer you need to keep secure

Mobile/wifi

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- Anything you share in plaintext is vulnerable
- Don't let your phone automatically connect
  - hackers use strong signals to get a shot at your mobile data

Great resources on security

- Verne Paxson
  - `http://www.icir.org/vern/`
- Avinash Kak
  - `https://engineering.purdue.edu/kak/compsec/Lectures.html`