

Computer Security

INFR10067

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1. Context

2. The security problem

3. Logistics

Adobe Systems Inc data breach - 2013

Adobe hack: At least 38 million accounts breached

bbc.co.uk/news/technology-24740873

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Technology

Adobe hack: At least 38 million accounts breached

30 October 2013



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Hancock warns flexing of rules 'could be fatal'

Health Secretary Matt Hancock says the NHS is under "very serious pressure" and warns people to stay home.

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Indonesia crashed plane's 'black boxes' located

2 hours ago

'Kind' pilot and newly-weds among air crash missing

1 hour ago

Features



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Equifax data breach - 2017

Equifax to pay up to \$700m to settle data breach

22 July 2019



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Tesco Bank data breach - 2016

Tesco Bank fined £16.4m · +

bbc.co.uk/news/business-45704273

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Tesco Bank fined £16.4m over cyber-attack

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Top Stories

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Features



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WannaCry ransomware - 2017



The screenshot shows a ransomware interface with a red header bar. The main message is "Oops, your files have been encrypted!" with a "English" dropdown. Below it, there's a large padlock icon.

What Happened to My Computer?
Your important files are encrypted.
Many of your documents, photos, videos, databases and other files are no longer accessible because they have been encrypted. Maybe you are busy looking for a way to recover your files, but do not waste your time. Nobody can recover your files without our decryption service.

Payment will be raised on
5/16/2017 00:47:55

Time Left
02:23:57:37

Your files will be lost on
5/20/2017 00:47:55

Time Left
06:23:57:37

Can I Recover My Files?
Sure. We guarantee that you can recover all your files safely and easily. But you have not so enough time.
You can decrypt some of your files for free. Try now by clicking <Decrypt>. But if you want to decrypt all your files, you need to pay.
You only have 3 days to submit the payment. After that the price will be doubled. Also, if you don't pay in 7 days, you won't be able to recover your files forever. We will have free events for users who are so poor that they couldn't pay in 6 months.

How Do I Pay?
Payment is accepted in Bitcoin only. For more information, click <About bitcoin>. Please check the current price of Bitcoin and buy some bitcoins. For more information, click <How to buy bitcoins>. And send the correct amount to the address specified in this window. After your payment, click <Check Payment>. Best time to check: 9:00am - 11:00am
CMT from Mandiant's Evil

Send \$300 worth of bitcoin to this address:
12t9DPgwueZ9NyMgw519p7AA8isjr6SMw

[About bitcoin](#) [How to buy bitcoins?](#) [Copy](#)

<http://www.wired.co.uk/article/wannacry-ransomware-virus-patch>

<http://www.telegraph.com/technology/0/ransomware-does-work/>

Global need for Computer Security

Some facts:

- ▶ Cybersecurity Ventures' estimate that the cyber-crime damage costs are predicted to hit \$6 trillion annually by 2021, up from \$3 trillion in 2015
- ▶ Cybersecurity Ventures' forecast that cyber-security spending will exceed \$1 trillion from 2017 to 2021
- ▶ GCHQ has characterised the cyber-security threat as being as serious as terrorism

But at the same time:

- ▶ Less than half of the businesses in the U.S., U.K., and Germany are prepared to deal with cyber-attacks according to Hiscox' Cyber Readiness Report (2017)
- ▶ Cybersecurity Ventures' predicts that there will be 3.5 million unfilled cyber-security jobs globally by 2021

1. Context

2. The security problem

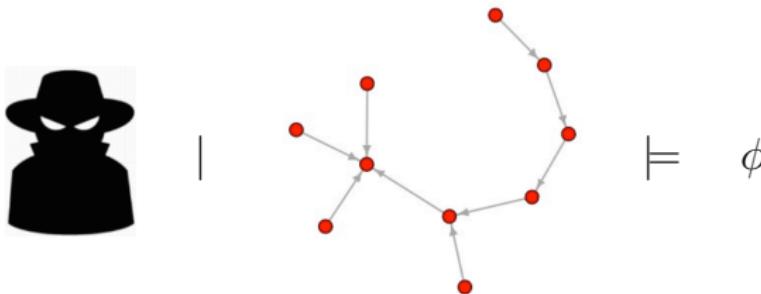
3. Logistics

What is computer security?

Computer security is the protection of computer systems against adversarial environments:

- ▶ Allow intended use
- ▶ Prevent unintended use

The security problem



- ▶ ϕ - security policy
e.g. confidentiality, integrity, availability, authenticity, anonymity, ...



- ▶ - attacker model

e.g personal motivation (spouse or boss), financial motivation (pharmaceutical, credit card theft), political motivation (governments, activists), ...

In this class

We will try to understand:

- ▶ why computer systems are insecure
- ▶ how to build secure systems

Topics of this class

- ▶ Access control and authentication
- ▶ Cryptography
- ▶ Communications security
- ▶ Network security
- ▶ Usable security
- ▶ Web security
- ▶ OS security
- ▶ Software security
- ▶ ...

Not everything you can technically do is legal!

You will learn things that are technically possible. But!

- ▶ Nothing here is intended as an incitement to crack!
- ▶ Breaking into systems to “demonstrate” security problems at best causes a headache to overworked sysadmins, and at worst compromises systems for many users and could lead to **prosecution!**
- ▶ If you spot a security hole in a running system, **don’t exploit it**, instead consider contacting the relevant administrators confidentially.

1. Context

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Admin

- ▶ 3 online pre-recorded lectures per week
- ▶ 1 online live Q&A session per week
- ▶ 5 tutorials: week 3, week 5, week 6, week 8, and week 11
- ▶ Teaching staff



Myrto Arapinis



Tariq Elahi



Markulf Kohlweiss

- ▶ Course webpage <http://course.inf.ed.ac.uk/cs/>

Assessment

- ▶ 3 courseworks
 - ▶ CW1 - formative - Friday 11 February at 16:00
 - ▶ CW2 - 12.5% total - Friday 11 March at 16:00
 - ▶ CW3 - 12.5% total - Friday 1 April at 16:00
- ▶ 1 final exam
 - ▶ May 2021
 - ▶ 75% total

Textbook

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PEARSON NEW INTERNATIONAL EDITION

Introduction to Computer Security
Michael Goodrich Roberto Tamassia
First Edition



Introduction to Computer Security
by Michael Goodrich and Roberto Tamassia
Pearson