



HOW TO: HACK A HOSPITAL

Ooops, your important files are encrypted.

If you see this text, but don't see the "Wana Decrypt0r" window, then your antivirus removed the decrypt software or you deleted it from your computer.

If you need your files you have to run the decrypt software.

Please find an application file named "@WanaDecryptor@.exe" in any folder or restore from the antivirus quarantine.

Run and follow the instructions!



The Reality of Cyber Attacks on Healthcare Systems



Benjamin Taylor - March 14, 2025



DISCLAIMER



- This presentation is for *educational purposes only* and does not promote, endorse, or encourage any illegal or harmful activities. I am not responsible for any misuse of the information presented.
- All content is intended to raise awareness about cybersecurity threats and the importance of protection against them.

THE PROBLEM

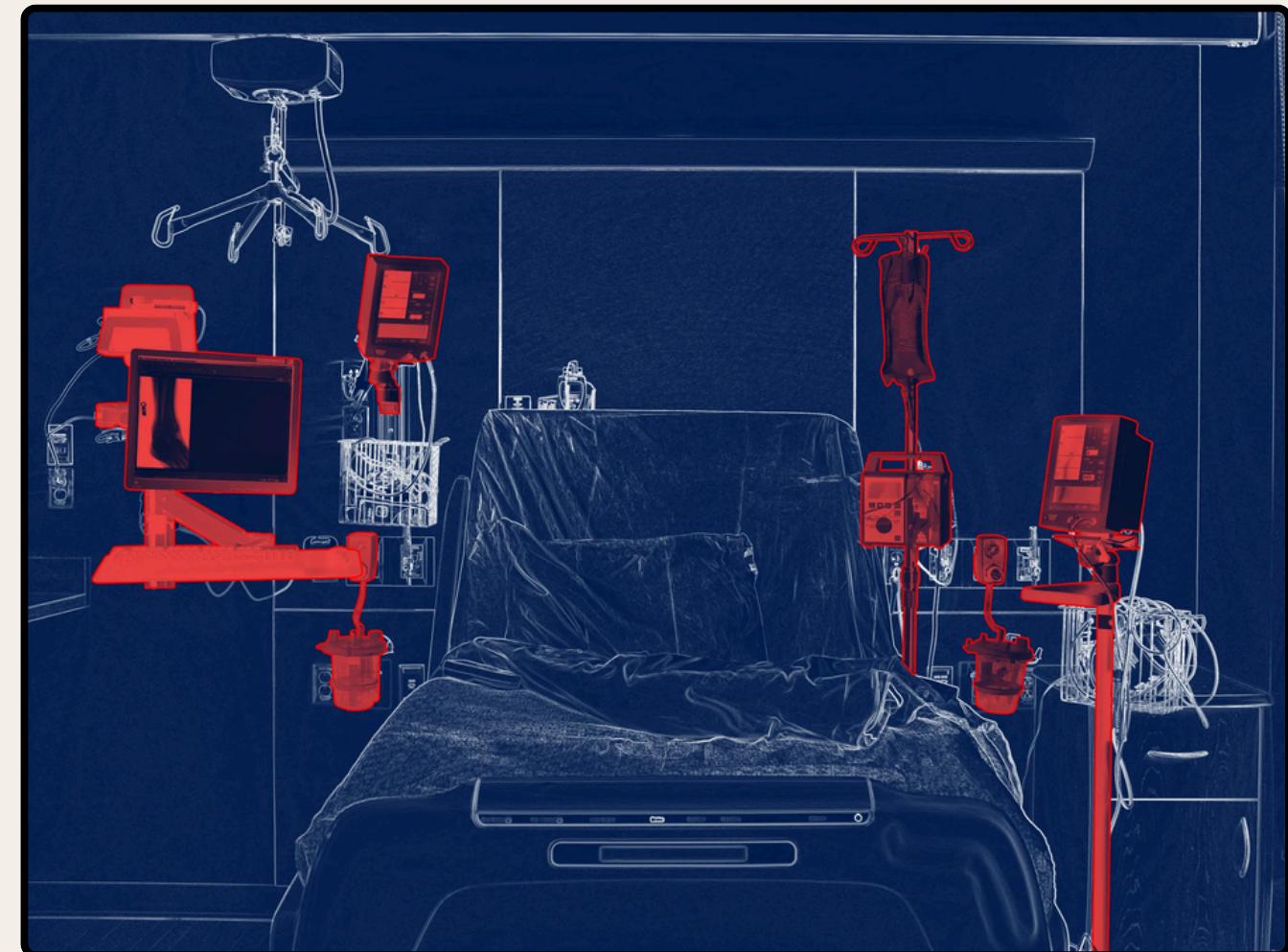


“The internet is about to start killing people, and the government regulates things that kill people.”

— Bruce Schneier, 2019, SecureWorld

- As IoT devices become more integrated into healthcare, transportation, & critical infrastructure, cyberattacks now have life-and-death consequences
- Cyberattacks, such as WannaCry, demonstrate how entire industries can go down in just minutes

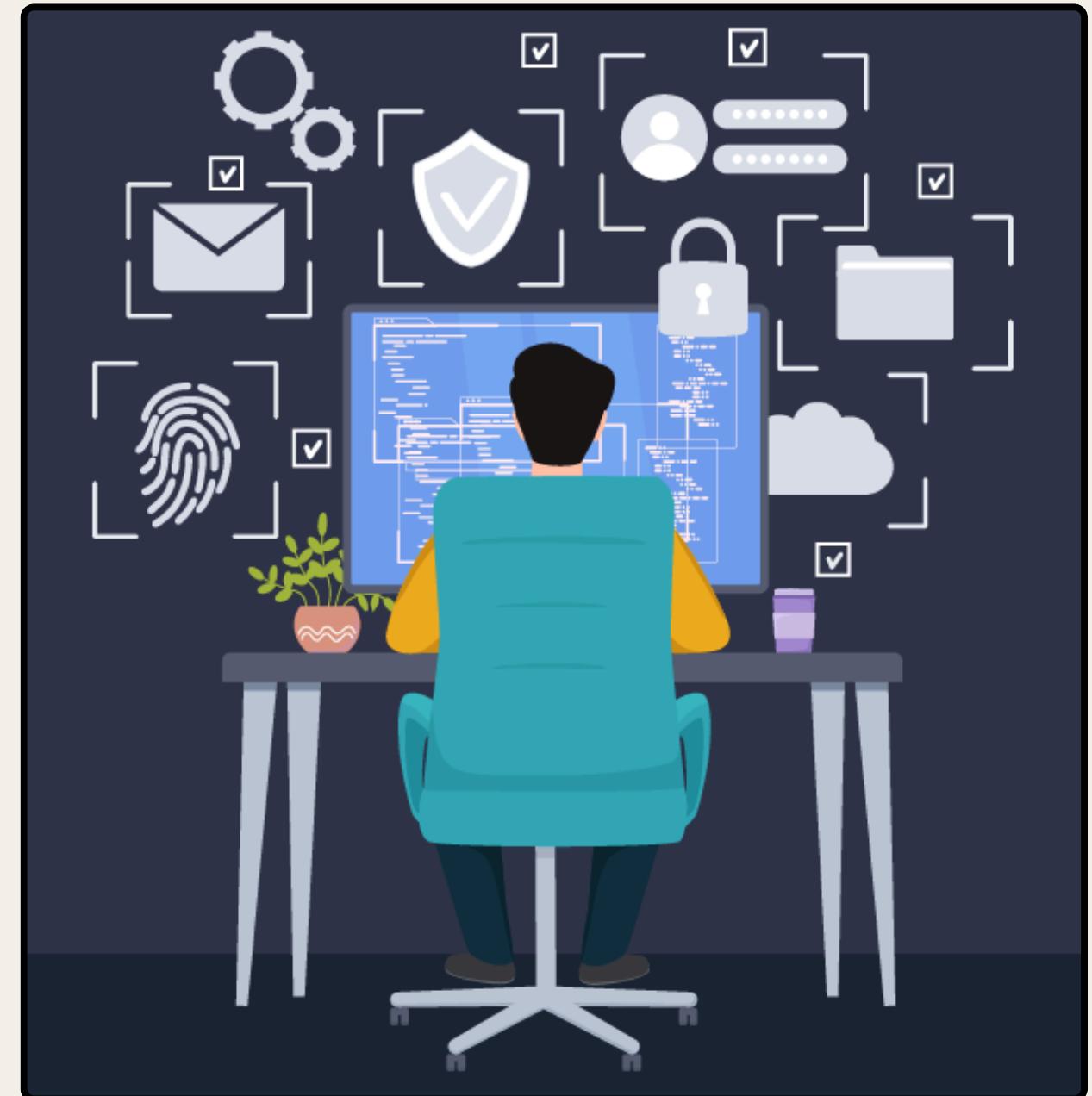
(Schneier, 2019, SecureWorld)



KEY DEFINITIONS



- **Cybersecurity:** "measures taken to protect a computer or computer system (as on the Internet) against unauthorized access or attack" (Merriam-Webster.com, 2025)
- **Internet of Things (IoT):** "the networking capability that allows information to be sent to and received from objects and devices (such as fixtures and kitchen appliances) using the internet" (Merriam-Webster.com, 2025)
- **Hacking:** "to gain illegal access to (a computer network, system, etc.)" (Merriam-Webster.com, 2025)
- **NSA:** National Security Association



OUR FOCUS TODAY



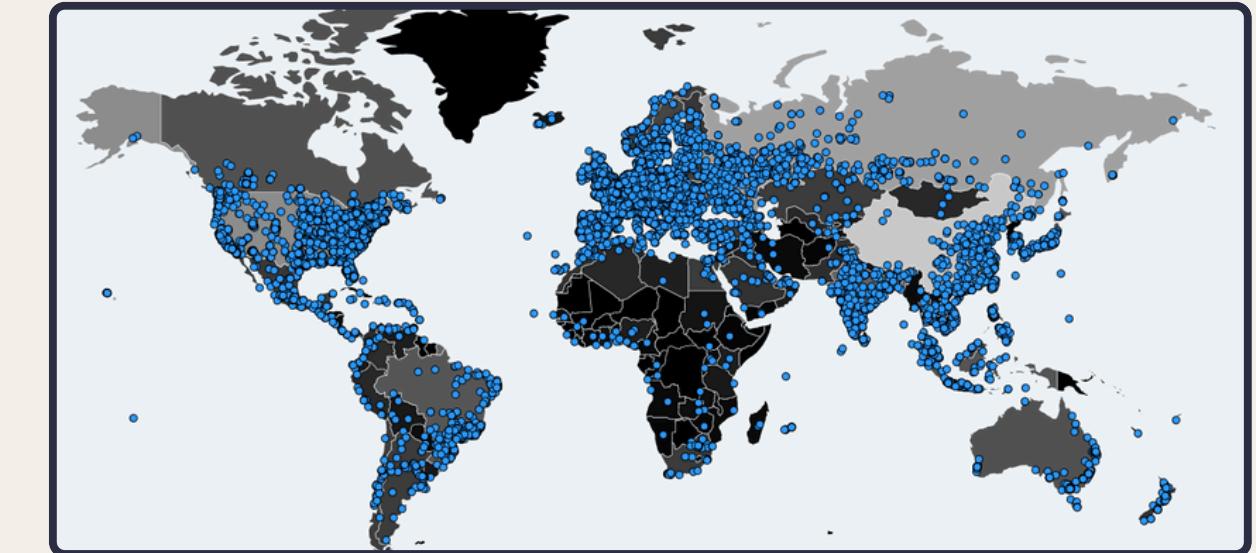
The purpose of this presentation is to *explore*
hardening cybersecurity in healthcare systems from
a historical, scientific, and ethical perspective.

I am a **student** at the University of North
Carolina at Charlotte studying Computer
Science with Cybersecurity concentration.

WHAT IS WANNACRY?



Global Ransomware Epidemic



- **WannaCry Ransomware Attack:** a major security incident that impacted organizations all over the world
- **May 12, 2017:** WannaCry ransomware worm spread to more than **200,000 computers** in over **150 countries**
- **Notable Victims:** FedEx, Honda, Nissan, UK's National Health Service (NHS)

Cloudflare. (n.d.).

THE WANNACRY HOSPITAL ATTACK



May 12, 2017 - The NHS Crippled in Minutes



National Health Service England. (2023, April 21).

- Hackers exploited outdated Windows systems in the **UK's National Health Service (NHS)**
- Over 80 hospitals & 595 general practitioner practices affected
- **Barts Health NHS Trust (London), East and North Hertfordshire NHS Trust, Lancaster Royal Infirmary** – surgeries canceled, ambulances diverted, patient care disrupted
- **Ransom Demand:** \$300 per system in Bitcoin
- **Medical Devices Infected:** MRI scanners, blood storage refrigerators, and diagnostic equipment rendered useless



Ooops, your files have been encrypted!

English

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

5/15/2017 12:36:07

Time Left

02:23:58:49

Your files will be lost on

5/19/2017 12:36:07

Time Left

06:23:58:49

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

GMT+8 - Monday, May 15, 2017



Send \$300 worth of bitcoin to this address:

115p7UMMngoj1pMvkpHjcRdfJNXj6LrLn

Copy

About bitcoin

How to buy bitcoins?

Contact Us

Check Payment

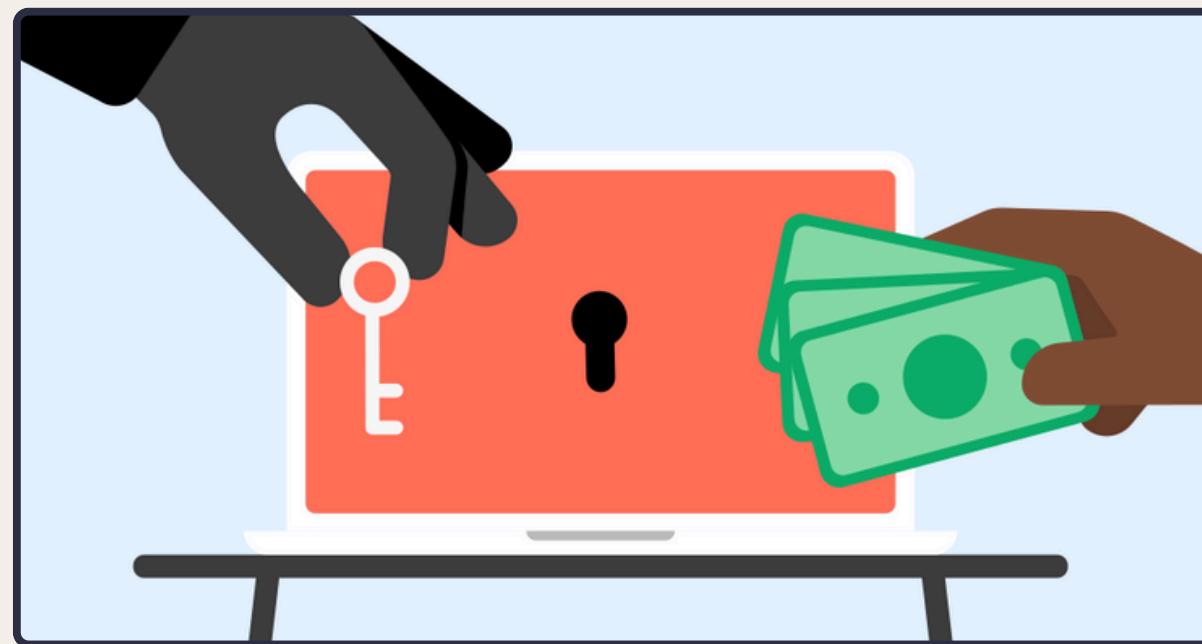
Decrypt

WHY ARE HOSPITALS VULNERABLE?



Why Were Hospitals an Easy Target?

- OUTDATED SYSTEMS
- INTERCONNECTED IoT DEVICES
- LACK OF CYBERSECURITY FUNDING
- IMPROPER DATA BACKUPS



Cluley, G. (2020, May 12).



EternalBlue



HOW WANNACRY SPREAD

- **EternalBlue Exploit (NSA LEAK):**
 - Hackers used leaked NSA tool to exploit unpatched systems
- **Self-Spreading Worm:**
 - Ransomware spread automatically through hospital networks
- **Data Encryption & Ransom:**
 - Patient files locked, ransom note appeared on every screen

NOTPETYA RANSOMWARE ATTACK



June 27, 2017 - Global Companies & Gov. Paralyzed

- Spread using **same NSA exploit** (EternalBlue) as WannaCry but **MORE DESTRUCTIVE**
- **Infected systems looked like ransomware but permanently wiped data instead**
- **Major Global Impact:** Shipping services, pharma, FedEx, hospitals, Chernobyl radiation monitoring stations all affected
- **\$10 Billion in Damages:** one of most costly cyberattacks in history



Greenberg, A. (2018, August 22).

REAL-WORLD CONSEQUENCES



IMMEDIATE IMPACT ON HOSPITALS

- Over 19,000 appointments and surgeries cancelled
- Ambulances diverted
- Locked out of patient records
- Inoperable medical devices

Wikipedia Contributors. (2023, August 20).



FINANCIAL & OPERATIONAL COSTS

- Approx. \$4 billion lost in recovery and lost services
- Massive delays in patient treatment
- Data restoration took weeks

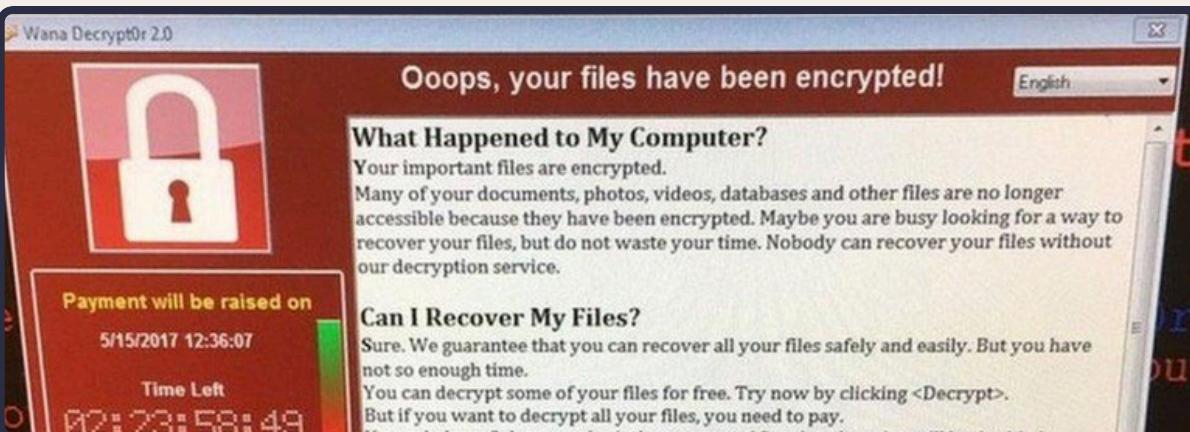
Cooper, C. (2018, May 15).



LONG-TERM CONSEQUENCES

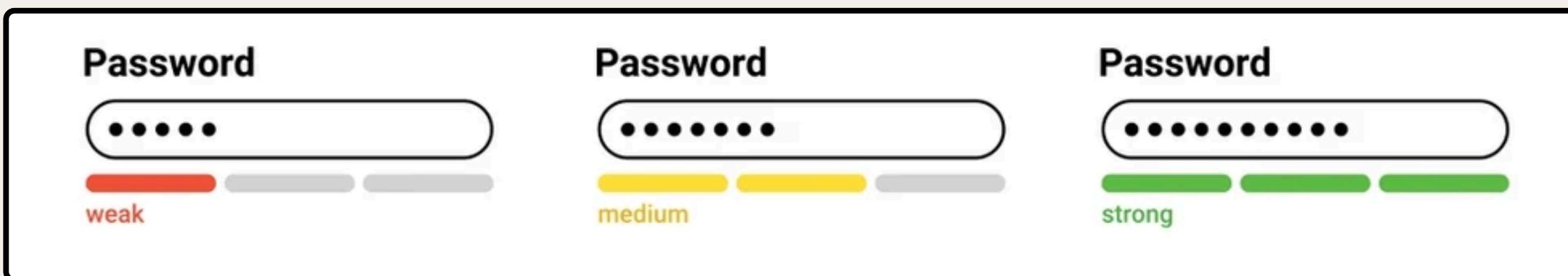
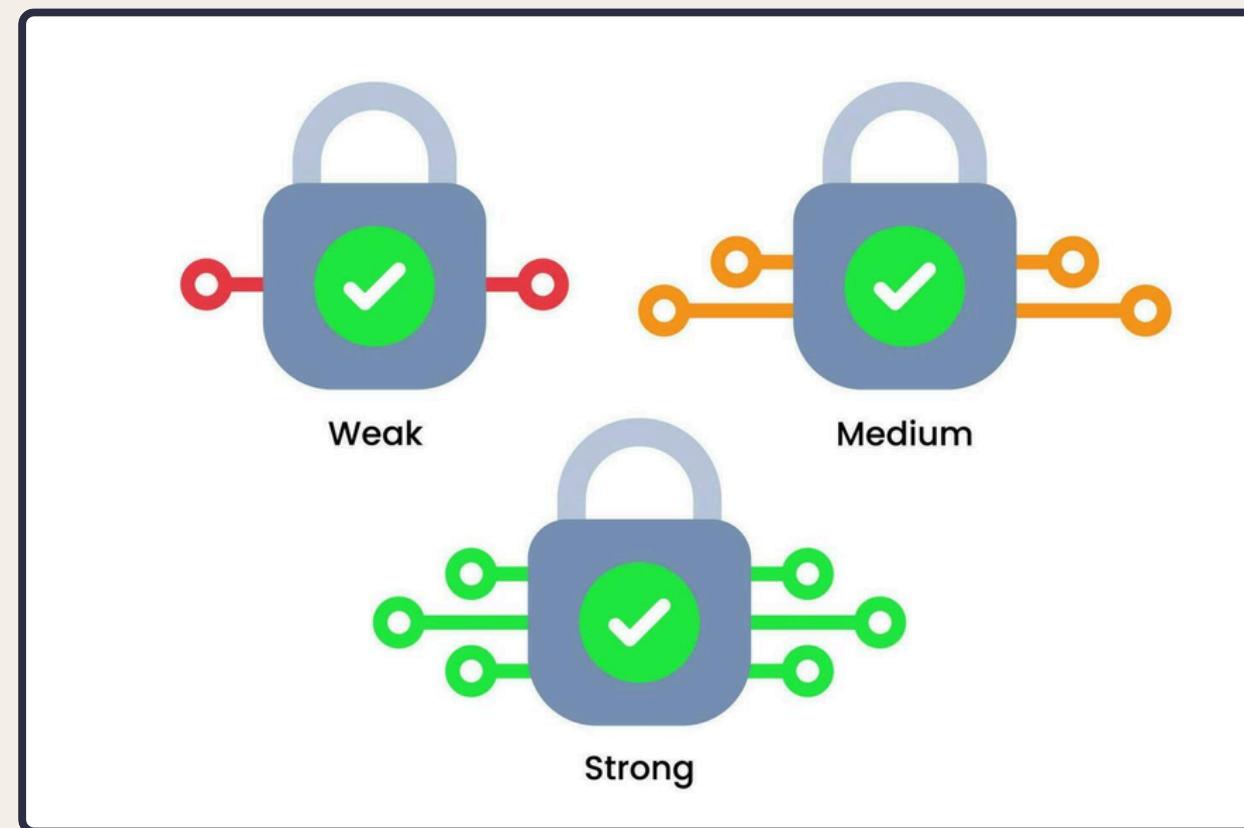
- Increased investment in cybersecurity awareness & IT infrastructure
- New government regulations for healthcare cybersecurity compliance
- Other ransomware attacks continued targeting hospitals (ex. Ryuk, Conti)
- Attacks keep happening because threatened hospitals are always going to pay ransoms

Cooper, C. (2018, May 15).



HOW TO PREVENT ANOTHER WANNACRY

- ⟳ Keep software up to date
- 🔒 Use strong and unique passwords
- 🛡️ Enable 2FA (two-factor authentication)
- ✉️ Don't click any suspicious links
 - *Phishing emails were the main entry point of the WannaCry attack*



Trend Micro. (n.d.).



Ransomware 'WannaCry' attack explained



Share



Watch on YouTube

HARDENING CYBERSECURITY



Strengthening Defenses to Protect Hospitals
from Cyber Threats



Network
Segmentation



Continuous Monitoring
& Threat Detection



Zero Trust Security
Model



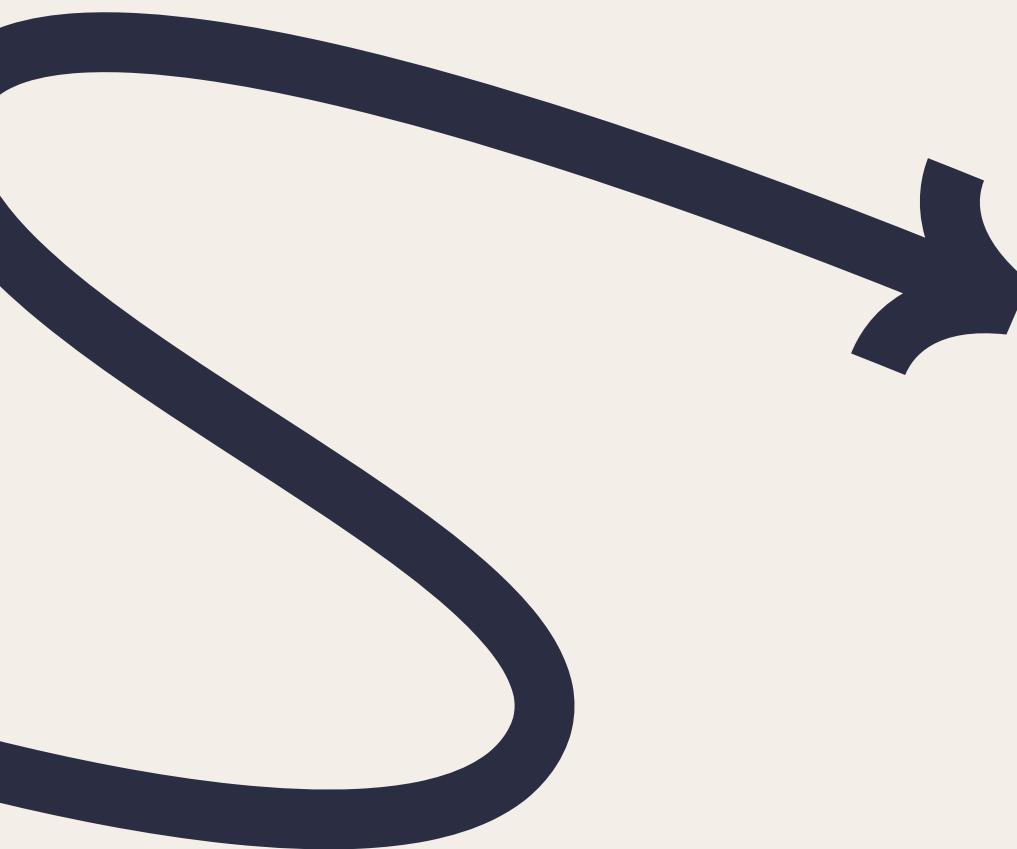
Regular Security Audits &
Compliance



HARDENING CYBERSECURITY



Strengthening Defenses to Protect Hospitals from Cyber Threats



Network Segmentation

“divides a computer network into smaller parts, with purpose to improve network performance and security.”

Cisco. (n.d.).



Continuous Monitoring & Threat Detection

“can prevent vulnerabilities from sprawling and getting out of hand, ultimately reducing damage from potential threats.”

Splunk. (n.d.).



Zero Trust Security Model

“no user, device, or application is automatically trusted, even if they are already inside a network, requiring strict identity verification and authorization for every access attempt.”

CISA. (n.d.).



Regular Security Audits & Compliance

“assesses effectiveness of existing security measures, detects security gaps/weaknesses, recommends improvements to mitigate security risks.”

Astra Security. (n.d.).

IoT EVERYWHERE IS AT RISK



SMART CITIES

- Hackers can shut down power grids, control traffic lights, and disable public services



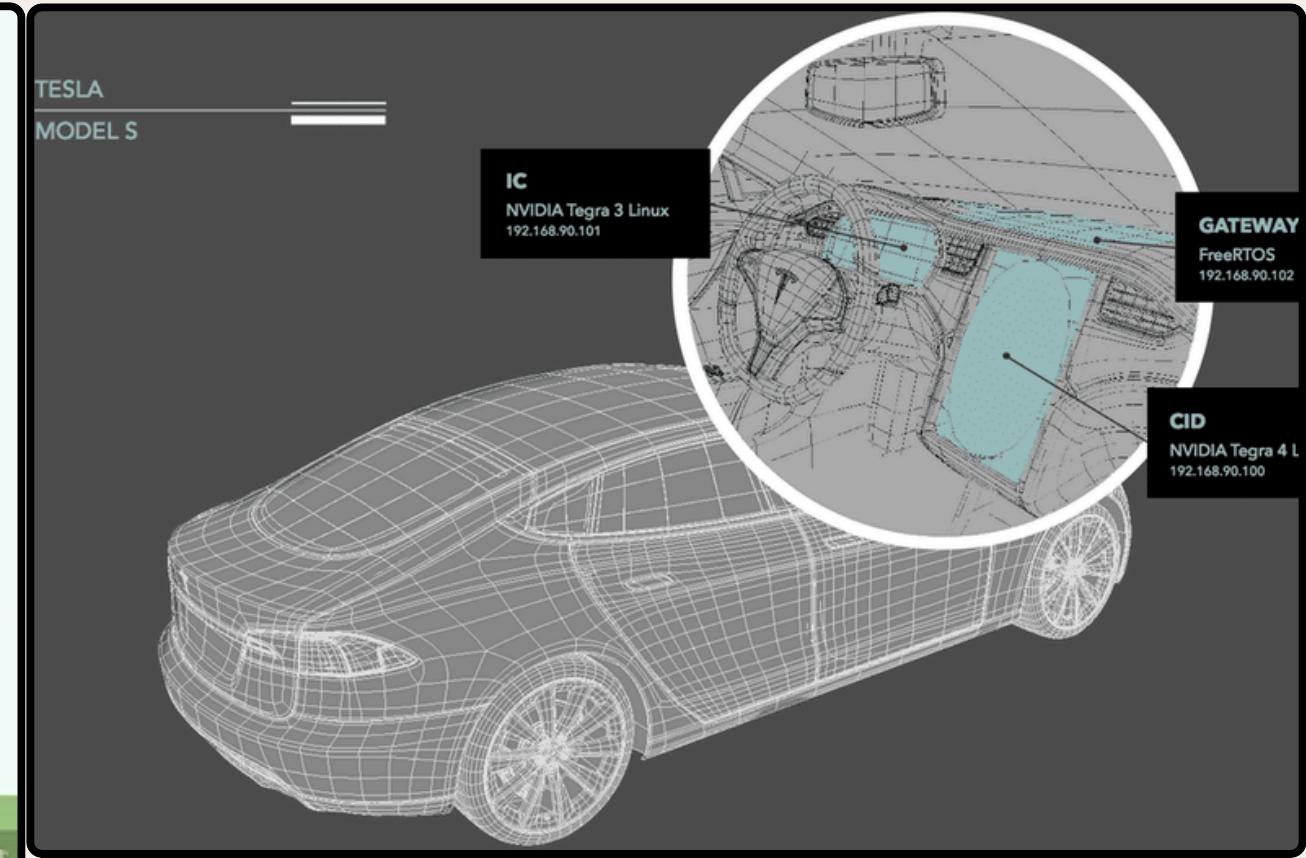
SMART HOMES

- Smart locks, cameras, and thermostats can be hijacked to spy or lock people out



SMART VEHICLES

- Self-driving cars (Tesla, etc.) can be remotely controlled by attackers
(2015 Tesla Model S Hack)



MOVING FORWARD

- **Invest in stronger security practices:** regular updates, multi-factor auth., and real-time monitoring can help stop cyber attacks
- **Raise awareness & educate people:** most attacks start with human error, and training can help prevent these risks
- **Advocate for better regulations & policies:** Governments need to enforce stricter security laws for IoT devices and critical infrastructure



THANK YOU!



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RELEVANT SOURCES

- <https://www.wired.com/story/notpetya-cyberattack-ukraine-russia-code-crashed-the-world/>
- <https://www.cloudflare.com/learning/security/ransomware/wannacry-ransomware/>
- https://en.wikipedia.org/wiki/WannaCry_ransomware_attack
- <https://www.npr.org/sections/thetwo-way/2017/05/15/528451534/wannacry-ransomware-what-we-know-monday>
- <https://www.cisa.gov/zero-trust-maturity-model#:~:text=Zero%20trust%20provides%20a%20collection,philosophy%20and%20culture%20around%20cybersecurity>
- <https://www.cisco.com/c/en/us/products/security/what-is-network-segmentation.html>
- https://www.splunk.com/en_us/blog/learn/continuous-monitoring.html
- <https://www.security.com/feature-stories/wannacry-lessons-learned-1-year-later>
- <https://www.healthcareitnews.com/news/wannacry-and-now-eternalblue-threats-prove-cybersecurity-review-must>
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- <https://ddm.health/case-studies/barts-health-nhs-trust>
- <https://www.getastral.com/blog/security-audit/security-audits/>
- <https://www.merriam-webster.com/>
- <https://www.royallondonrotation.com/our-hospitals>
- <https://www.techtarget.com/iotagenda/definition/smart-home-or-building>
- https://www.shutterstock.com/search/strong-passwords?image_type=vector