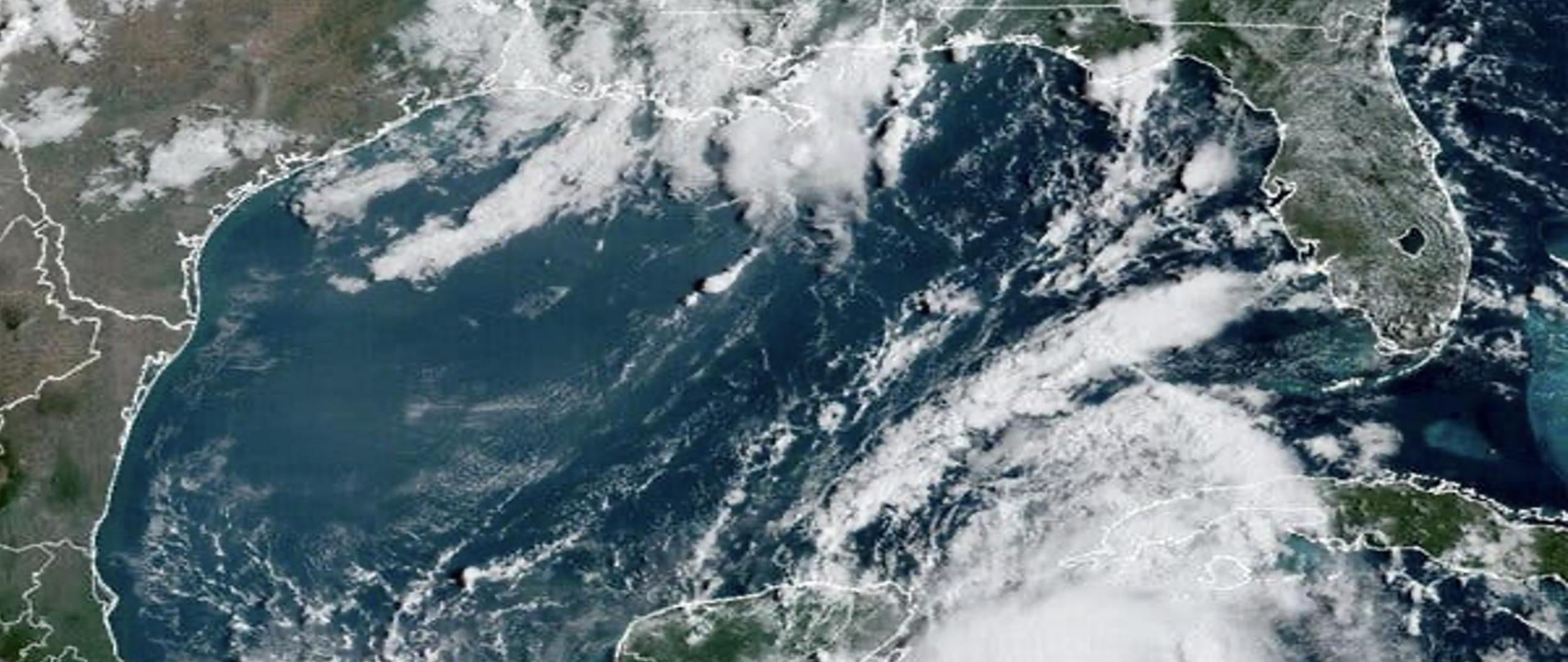


What Can We Learn from Major Cyber Catastrophes?



Hurricanes: Partially Controllable by Humans



TO ENGINEER IS HUMAN

The Role of Failure in Successful Design



With a new afterword by the author

"Serious, amusing, probing,
sometimes frightening
and always literate."
—Los Angeles Times

HENRY PETROSKI

Author of THE EVOLUTION OF USEFUL THINGS

Bridge Collapses: Mostly Controllable by Humans



Space Exploration Risk: Mostly Controllable by Humans



Cybersecurity Incidents: Fully Controllable by Humans

Numerator:
“Visit Mars”



Denominator:
“Space Deaths”



Observation: You can measure the success of an industry by dividing its achievements by its failures.

Numerator

Value Equation for Cyber



Success of Cybersecurity: Technologies That Enable Innovation, Automation, and Progress

Failure of Cybersecurity: Malicious Hacking, Break-Ins, Breaches, Disruptions and other Incidents

Denominator

Let's spend time reviewing the denominator of this equation

What Can We Learn from Major Cyber Incidents?

Jan 2014



40 Million Credit Cards Stolen from Target

- Hacked third-party vendor access unnoticed from 12/2/13 to 1/16/14
- CEO and CIO of Target apologized and resigned
- Remediation/legal costs: \$162M (Target) and \$200M (Banks)

Jan 2014



Third-Party Breach

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May 2014



145 Million eBay Users Hacked

- Compromised name, encrypted password, email, home address, etc.
- Companywide password reset function was used in the attack.
- “The focus is on recovery,” CEO John Donahoe.



May 2014

Password Problems

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Sept 2014



Five Month Undetected Attack at Home Depot

- Compromised 56 million customer payment cards – Five-month Dwell Time
- CEO apologized publicly after the cyber attack
- Famous security budget retort from ex-employee: “We sell hammers.”

Sept 2014



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76 Million Households Hit by JPMC Breach

- Customer contact information – name, email, address, and phone
- 2014 attack blamed on Russian hackers by FBI
- CEO Jamie Dimon claims increasing JPMC Cyber Security budget by \$250M

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Nov 2014



Sony Destructively Hacked by North Korea

- Destructive malware attack ruined Sony compute infrastructure
- Revealed corporate emails including racist remarks about Pres. Obama
- “It was an attack on our freedom of expression.” DHS Secretary Johnson

Nov 2014

Destructive Attack



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Feb 2015

The Details

- Company notified feds immediately
- No information compromised
- Massive database hacked



JUST IN

#abc15

FBI INVESTIGATING LATEST DATA BREACH
ANTHEM INC. CREDITED FOR PROMPTLY NOTIFYING AUTHORITIES



10:06 65°

80 Million Medical Records Stolen from Anthem

- Two-month process to notify astonished customers
- Abnormal system behavior went unnoticed for several months
- “I want to personally apologize to each of you.” Joseph Swedish, CEO

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Anthem.



Insurance Records

JUST IN

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Mar 2015



11 Million Premera Customer Insurance Records

- Thirty-eight class action lawsuits based on 2015 attack
- Name, birthdate, SSN, address, bank account info, claim info, etc.
- “Privacy of our members’ personal information remains a priority.”

Mar 2015



Class Action Lawsuits

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Hackers Nab Data on 18,000 Penn State Students

- Started in September 2012, continued through mid-2014
- University claims attack carried out by Chinese threat actor
- CISO being recruited (\$300K- \$700K) – Avg. Public College Pres. (\$428K)



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Sixteen Month Undetected OPM Breach

- Background and thumbprints for 15% of the US workforce
- Director Katherine Archuleta resigned 7/15
- Military group from PRC most likely malicious actor

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Advanced Persistent
Threat (APT)

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June 2015

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- Involved eight colleges (Arts & Sciences, Divinity, Radcliffe, etc.)
- University has no clear understanding of what happened or how
- FAQ suggests that everyone change their passwords

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Oct 2015

Letter to Consumers



T-Mobile CEO on Experian's Data Breach

I've always said that part of being the Un-carrier means telling it like it is. Whether it's good news or bad, I'm going to be direct, transparent and honest.

We have been notified by Experian, a vendor that processes our credit applications, that they have experienced a data breach. The investigation is ongoing, but what we know right now is that the hacker acquired the records of approximately 15 million people, including new applicants requiring a credit check for service or device financing from September 1, 2013.

15 Million T-Mobile Records via Experian Breach

- Experian providing third-party marketing services to T-Mobile
- Name, address, SSN, birth date, passport/driver's license, etc.
- "T-Mobile's Legere 'Incredibly Angry' about Breach" – News Reports

Oct 2015

Letter to Consumers

Blame Others

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Nov 2015



COMCAST

Comcast Resets Customer Account Passwords
Due To User Information Being Sold Online



200,000 Comcast Customer Records Exposed

- Company reported 200,000 customer records “exposed to hackers”
- 590,000 customer records for sale on Dark Web for \$1,000.00
- Company requested that customers change their passwords

Nov 2015



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Dec 2015



Plant supporting Stroganovka,
outside Simferopol, Crimea

Hackers Shut Power to 80,000 Ukrainian Citizens

- Hacked Power Company 1: Prykarpattyoblenergo Electric Utility
- Hacked Power Company 2: Kyivoblenergo Electric Utility
- Affected Six More Companies with BlackEnergy Trojan Horse

Dec 2015



Attempt to Kill

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Jan 2016



191 Million US Voter Records Compromised

- NationBuilder collects information and provides as-a-service
- “We strongly believe in making voter information more accessible to political campaigns and advocacy groups,” NationBuilder’s CEO Jim Gilliam

Jan 2016



Public Data Aggregation

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Mar 2016



Hackers Sell 1.5 Million Customer Records

- 1.5 million Verizon customer records stolen from the company
- Sale price: \$100,000 for the entire package on the Dark Web
- Verizon blamed an exploitable flaw in their Website

Mar 2016



Selling Stolen Data

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Apr 2016



1,025 Wendy's Stores Hit by Credit Card Breach

- Blamed on unnamed third-party with access to company
- Company hit with class action lawsuit after the breach
- Initial statement under-estimated impact by the company initially

Apr 2016



Compliance Issue

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May 2016



427 Million Stolen MySpace Passwords

- Hacker selling batch for \$2800 payment
- Hacker also claims to have data on 164M LinkedIn Accounts
- Danger: Do not reuse passwords across accounts

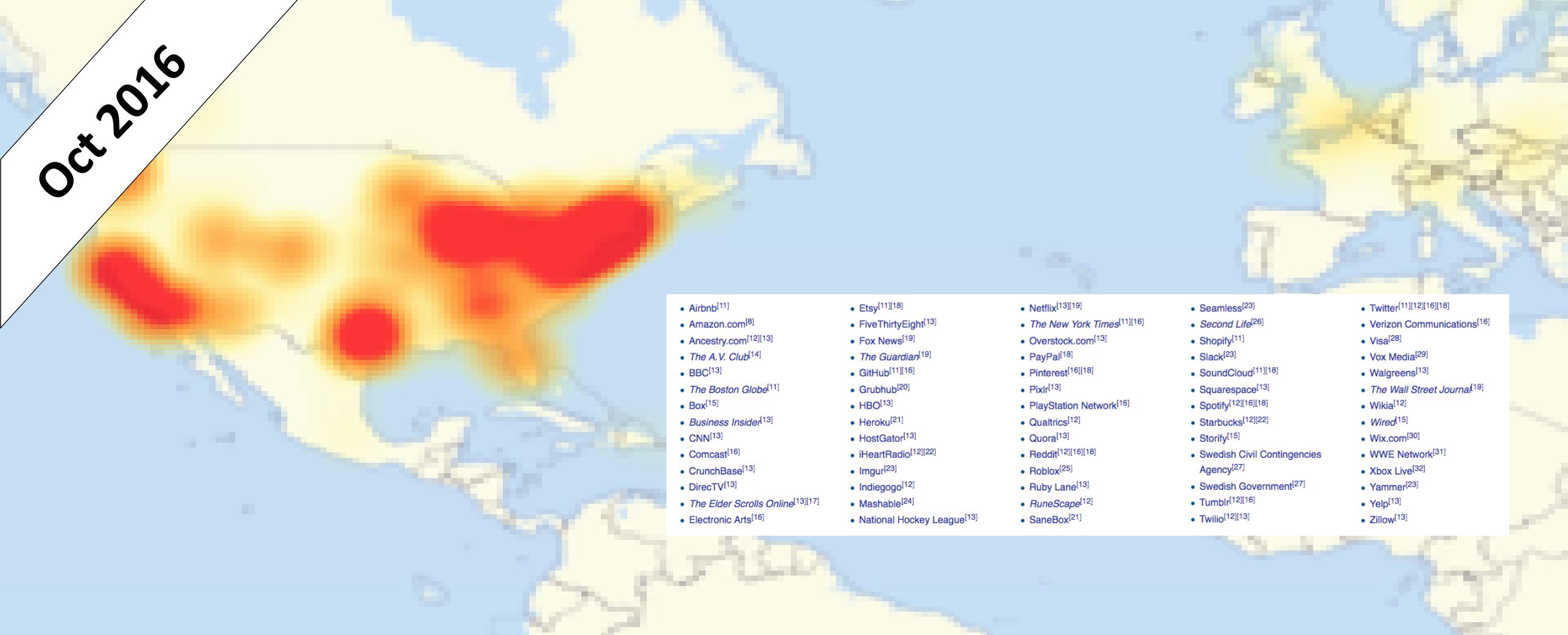
May 2016



Legacy System

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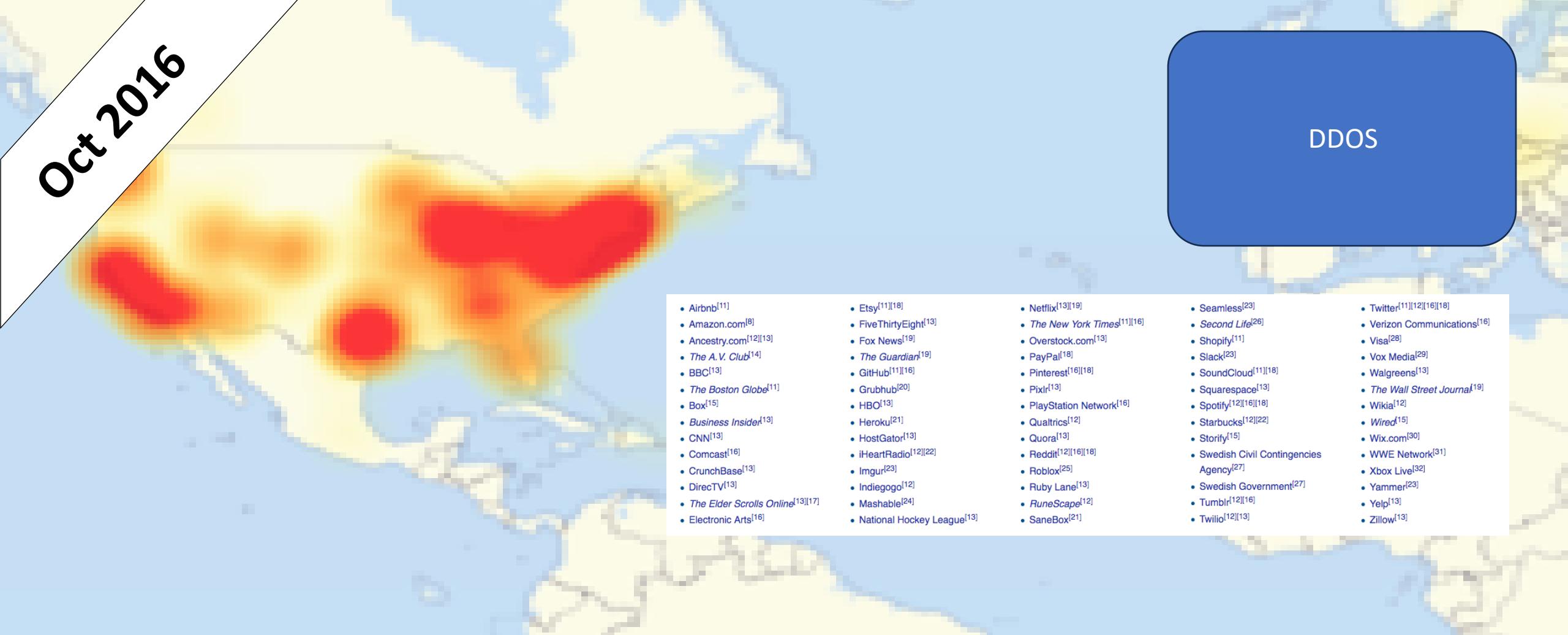


Oct 2016

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DYN DDOS Attack

- Massive DDOS attack (possibly by Anonymous)
- Caused outages across major North American services
- Botnet: Cameras, gateways, baby monitor, and other IoT devices



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Nov 2016

hate. The South will rise again!

South United
Community
137,138 people like this.

Like Page

 **Army of Jesus**
Sponsored

Like Page

Today Americans are able to elect a president with godly moral principles. Hillary is a Satan, and her crimes and lies had proved just how evil she is. And even though Donald Trump isn't a saint by any means, he's at least an honest man and he cares deeply for this country. My vote goes for him!

**SATAN: IF I WIN CLINTON WINS!
JESUS: NOT IF I CAN HELP IT!**

PARTY OF JESUS

PRESS 'LIKE' TO HELP JESUS WIN!

97 Reactions 15 Comments 29 Shares

Like **Comment** **Share**

US Election “Information” Attacks

- Difference between “cyber superiority” and “information superiority”
- American Intelligence Community concludes Russian origin
- Social media manipulated using poorly monitored features

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Fake News

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May2017



WannaCry Ransomware Attack

- Hits 300,000 targets including National Institute of Health (NIH)
- Spread via worm using tools stolen from NSA
- Suggests weak disaster planning across most global business

May2017



Ransomware

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July 2017

EQUIFAX DATA BREACH

AFFECTS 143 MILLION AMERICANS



- NAMES
- BIRTH DATES
- SOCIAL SECURITY NUMBERS
- ADDRESSES
- DRIVER'S LICENSE NUMBERS

Equifax Breach Affects 143M US Citizens

- Vulnerabilities unpatched in Apache Struts in Equifax portal
- First vulnerability reported weeks before attack commenced
- Hackers created 39 undetected back doors into Equifax

July 2017

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Open Source

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Business
Aug 2017

Data breach! Aadhaar software hack poses major security concerns

software patch, which can be bought for as little as Rs 2,500 - reportedly allows unauthorised persons, based anywhere in the world, to generate Aadhaar numbers.

 BusinessToday.In

Last Updated: September 11, 2018 | 21:18 IST



Aadhaar Exposes 1.1B Citizens of India

- Breach exposed Aadhaar number, names, emails, and physical addresses.
- Also breached phone numbers and photos.
- Break-in to India's Unique Identification Authority (records of all citizens)

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Nov 2017



Hackers Breach Personal Data for 45M Uber Riders

- Attack occurred in 2016 (GitHub account), but reported in 2017
- Hackers demanded \$100K for data and Uber paid the fee
- Cover-up causing considerable litigation on-going

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June 2018

Marketing Firm Exactis Leaked a Personal Info Database With 340 Million Records

SHARESHARE
5567

TWEET



COMMENT



EMAIL

ANDY GREENBERG SECURITY 08.27.16 01:34 PM

MARKETING FIRM EXACTIS LEAKED A PERSONAL INFO DATABASE WITH 340 MILLION RECORDS



MOST POPULARSCIENCE
We Have No Idea How Bad the US Tick Problem Is
MEGAN MOLTENISCIENCE
The Air Force Is Already Betting on SpaceX's Brand-New Falcon Heavy
AMY THOMPSONCULTURE
How the Startup Mentality Failed Kids in San Francisco
DANIEL QUANE

[MORE STORIES](#)

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- Security researcher noticed database openly accessible (via Shodan)
- Massive implications for citizen privacy

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5567 TWEET COMMENT EMAIL

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How the Startup Mentality Failed Kids in San Francisco DANIEL QUANE MORE STORIES

Big Data

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Dec 2018

A+ FEATURES

MARRIOTT HACK MAY HAVE EXPOSED UP TO 500 MILLION CUSTOMERS

Starwood/Marriott Exposes Data for 500M Guests

- Breach exposed names, email addresses, and physical addresses.
- Also phone numbers, passport numbers, and account info.
- Also birth dates, gender, travel info, and accommodation info.
- Second Largest Breach Ever. (After Yahoo)

Dec 2018

A+H E R A

Massive Attack

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Jul 2019



DATA BREACH

CapitalOne Breach Affects 100M Accounts

- Breach involved AWS misconfiguration
- Affected 100 million individuals in the US and 6 million in Canada
- Credit card and social security number information

Jul 2019

Cloud Security



DATA BREACH

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Sept 2019



Ecuador

THE ENTIRE COUNTRY LEAKED

Ecuador Exposes 118% of Citizens Data

- Misconfigured Ecuadorian government database leaked 20.8 million user records
- Birth data, marital status, national ID, home addresses, children's info, phone and education recs.
- Official population is about 17.5 million

Sept 2019

Security Metrics



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Apr 2020



Hackers Sell Half Million Zoom Accounts

- The credentials of over 500K Zoom accounts were stolen by hackers
- Found for sale on the Dark Web and hacker forums for as little as two cents per account.
- Email addresses, passwords, personal meeting URLs, and host keys stolen

Apr 2020



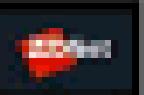
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Jul 2020



Bill Gates
@BillGates



Everyone is asking me to give back, and now is the time.

I am doubling all payments sent to my BTC address for the next 30 minutes. You send \$1,000, I send you back \$2,000.

BTC Address -

Twitter Account Takeover (ATO) Breach

- Too many team members had access to account information
 - Fake Tweets sent out from prominent accounts (e.g., politicians, etc.)
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Jul 2020

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Jul 2020

Edward Amoroso posted this



Why I Don't Support Mudge's Decision.

Edward Amoroso on LinkedIn

August 24, 2022

118,652 impressions

You and 441 others

288 comments

View analytics

Dec 2020



SolarWinds Breach

- Nation-State (Russian) Advanced Persistent Threat (APT)
- Malicious code injection – target supply chain to users
- Massive number of victims in the US Federal Government

Dec 2020



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May 2021



Colonial Pipeline Attack

- Ransomware attack to Northeastern US pipeline delivery
- Nation-state involvement likely – company paid ransomware
- More serious implications if attacker had been more destructive

May 2021



OT Security

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Dec 2021

Apache Log4j 2

Apache Log4j 2 is an upgrade to Log4j that provides significant improvements over its predecessor, Log4j 1.x, and provides many of the improvements available in Logback while fixing some inherent problems in Logback's architecture.

Important: Security Vulnerability CVE-2021-44832

Summary: Apache Log4j2 vulnerable to RCE via JDBC Appender when attacker controls configuration.

Details

Apache Log4j2 versions 2.0-beta7 through 2.17.0 (excluding security fix releases 2.3.2 and 2.12.4) are vulnerable to a remote code execution (RCE) attack where an attacker with permission to modify the logging configuration file can construct a malicious configuration using a JDBC Appender with a data source referencing a JNDI URI which can execute remote code. This issue is fixed by limiting JNDI data source names to the java protocol in Log4j2 versions 2.17.1, 2.12.4, and 2.3.2.

Mitigation

Upgrade to Log4j 2.3.2 (for Java 6), 2.12.4 (for Java 7), or 2.17.1 (for Java 8 and later)

Log4J Vulnerability

- 1.8 million probes against half of corporate networks launched in December 2021
- Evidence of nation-state involvements using 70 malware families
- Actual impact is unknown so far (stay tuned)

Dec 2021

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Vulnerability
Management

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- Actual impact is unknown so far (stay tuned)

Mar 2022



Lapsus\$ Rampage

- Teenager in the UK rampages Microsoft, Nvidia, and other major targets
- High-profile compromise of internal Microsoft DevOps account
- Ransomware demands (e.g., Nvidia make code open-source, etc.)

Mar 2022



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Sept 2022



Uber Breach

- Social engineering attack (fake IT call) to an Uber employee for password
- Teenager hacker gained access to entire Uber infrastructure from this access
- Follows 2016 attack (57 million accounts compromised)

Sept 2022



Mobile Apps

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Dec 2022

[Blog](#) > [Product Updates](#) > Notice of Recent Security Incident

Karim Toubba

December 22, 2022 | By [Karim Toubba](#)

Notice of Recent Security Incident

LastPass Loses Passwords to Hacker

- Hacker gained access to LastPass trove of password information
- Hacker managed to decrypt and steal passwords (ugh)
- Issue calls into question safety of password managers

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Cybersecurity Vendor



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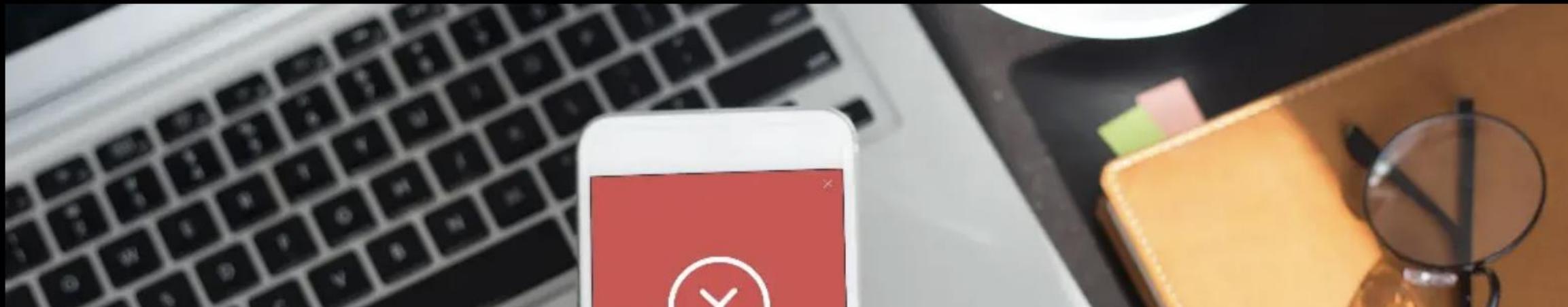
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Dec 2022

May 2023

Security Intelligence

ChatGPT Confirms Data Breach, Raising Security Concerns



Initial Hack on ChatGPT

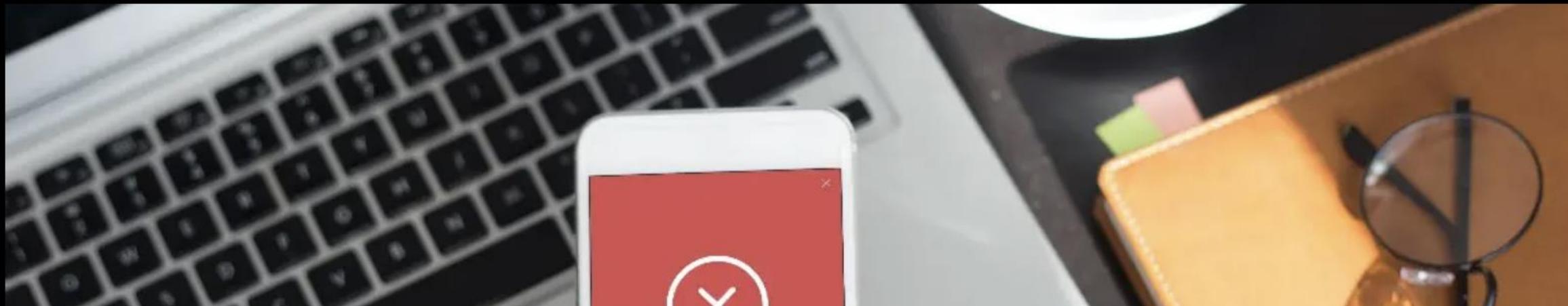
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May 2023

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May 2023

Fake viral images of an explosion at the Pentagon were probably created by AI

May 22, 2023 · 6:19 PM ET



Shannon Bond



Deep Fake Image of Explosion on Twitter

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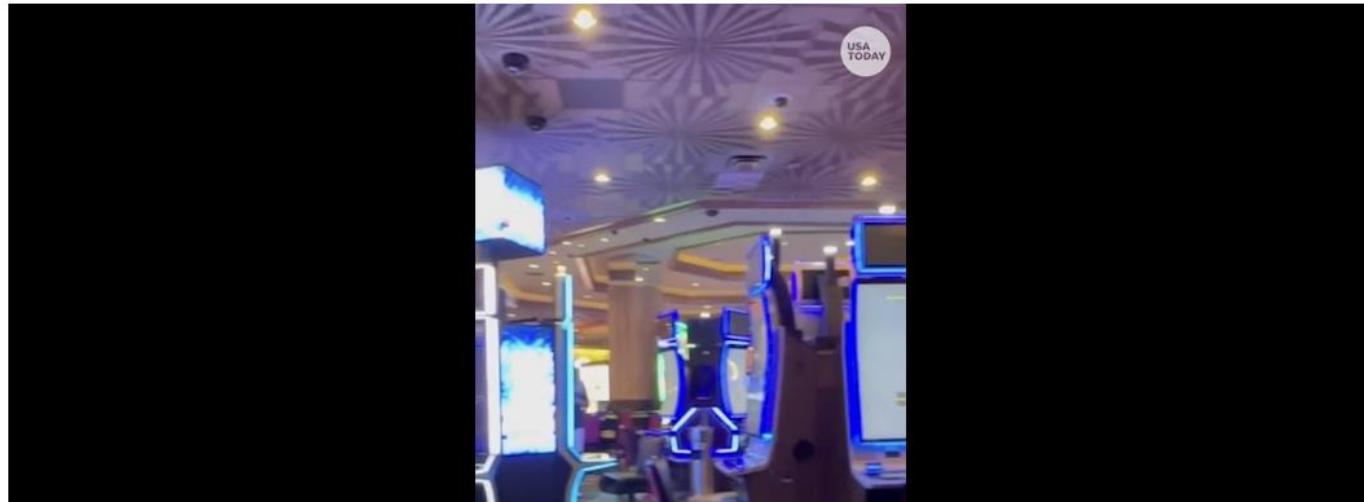
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Aug 2023

MGM Resorts properties in US shut down computer systems after cyber attack

Amaris Encinas USA TODAY

Published 8:02 p.m. ET Sept. 11, 2023 | Updated 7:43 p.m. ET Sept. 13, 2023



Cyber-Attack Degrades Operations at MGM

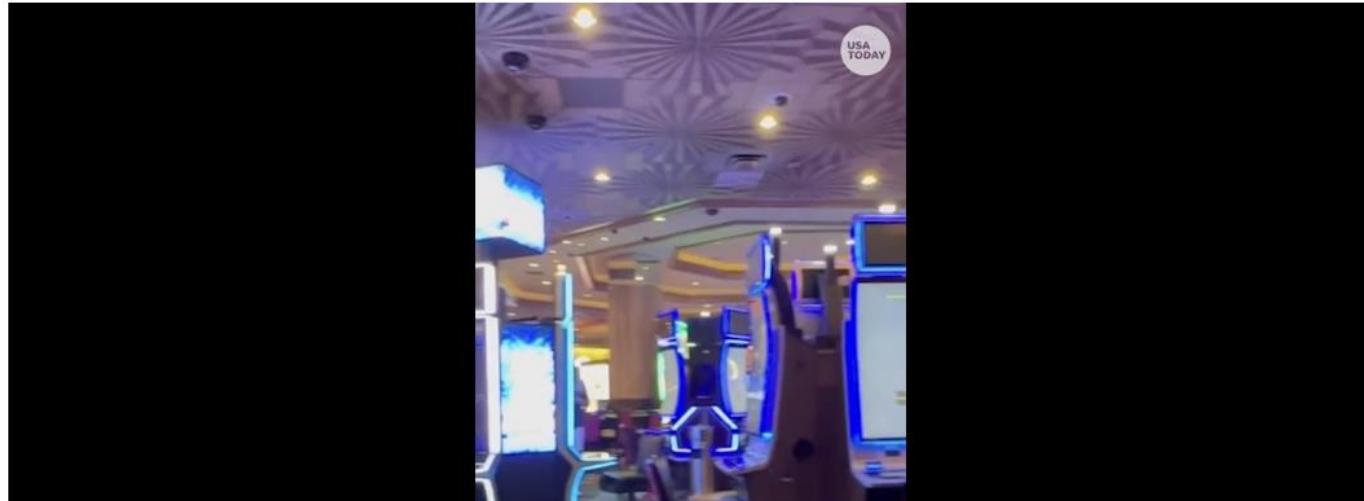
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Security

23andMe confirms hackers stole ancestry data on 6.9 million users

Lorenzo Franceschi-Bicchieri @lorenzofb • 12:56 PM EST • December 4, 2023

 Comment



Hackers Bypass 2FA at 23andMe

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Jan 2024

Mother of all breaches reveals 26 billion records: what we know so far

Updated on: January 29, 2024 10:07 AM 3

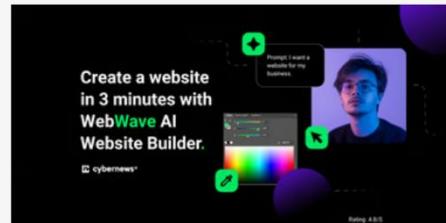


Vilius Petkauskas, Deputy Editor



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AI-powered WebWave: revolutionizing small business websites

by Cybernews Team 16 April 2024

Editor's choice



Massive Hack of Many Platforms

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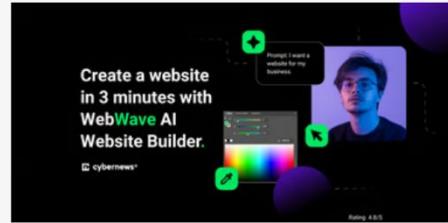
Vilius Petkauskas, Deputy Editor

Aggregated Attack



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Change Healthcare cyberattack

UPDATED MAY 20, 2024 • 13 MIN READ

Massive Ransomware Attack to UnitedHealth Group

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Feb 2024

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DALLAS, March 30, 2024

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AT&T has determined that AT&T data-specific fields were contained in a data set released on the dark web; source is still being assessed.

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U.S. confirms Trump campaign claim it was breached by Iranian hackers

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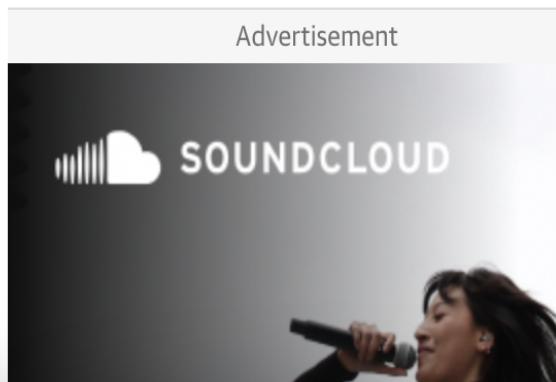
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US news

Chinese hackers breach US treasury network, gain access to some files

Third-party cybersecurity provider was compromised after hackers obtained key to override certain systems

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U.S. Treasury Compromised by BeyondTrust Hack

- Unclear what information was stolen by nation-state actor
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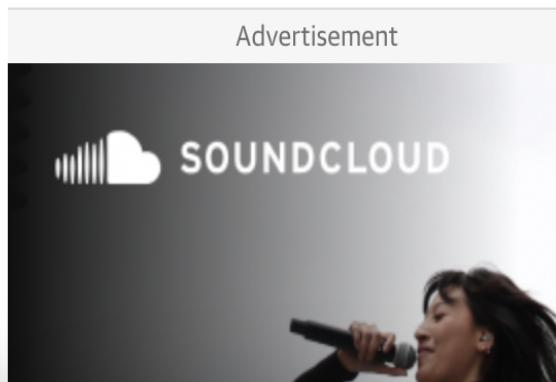
Hacked Security Tool

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We just covered:

Third-party breach. Password Problems, Dwell Time, Security Budget, Destructive attack, Insurance Records, Class Action Lawsuits, CISO Salaries, Advanced Persistent Threats (APTs), Bad Response, Blame Others, Bad Account Inventory, Attempt to Kill, Public Data Aggregation, Selling Stolen Data, Compliance Issue, Legacy System, DDOS, Fake News, Ransomware, Open Source, International, Bug Bounty, Big Data, Massive Attack, Cloud Security, Security Metrics, Work from Home, Account Takeover, Software Supply Chain, OT Security, Vulnerability Management, Hacking Groups, Mobile Apps, Cybersecurity Vendor, AI, Deep Fake Images, Operational Shutdown, 2FA Attack, Aggregated Attack, Cryptanalysis, Political Sabotage, . . .

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*Develop
24 of
these
pairs*

This is fictitious attack 1, how it happened, who it affected, and when it happened.

This is how attack 1 could have been prevented.



Why Do These Hacks Continue
to Happen?

For small, simple things:
I know how they work.
I don't know what they do.



It is easy to protect these
things from hacking or tampering.

For large, complex things:
I know what they do.
I don't know how they work.



It is difficult to protect these
things from hacking or tampering.

What Can Cybersecurity Learn from Bank Robberies?







Robby™ Panic

Hold-Up & Panic



Foot activated hold-up station Robby

Foot activated hold-up station

Reliable easy to operate foot activated hold-up device
Operated by lifting the foot tip
Foot activated robbery & panic station
Foot activated hold-up station with rugged metal housing
Designed to minimize the possibility of false alarms
Foot operated panic and robbery station
Designed for high-end security applications
Foot activated panic station for distress Alarm System (DAS)
Applicable for bank branches, diamonds & jewelry shops
Foot activated hold-up station used in banks and change kiosks
Send silent alarm to local or remote security center

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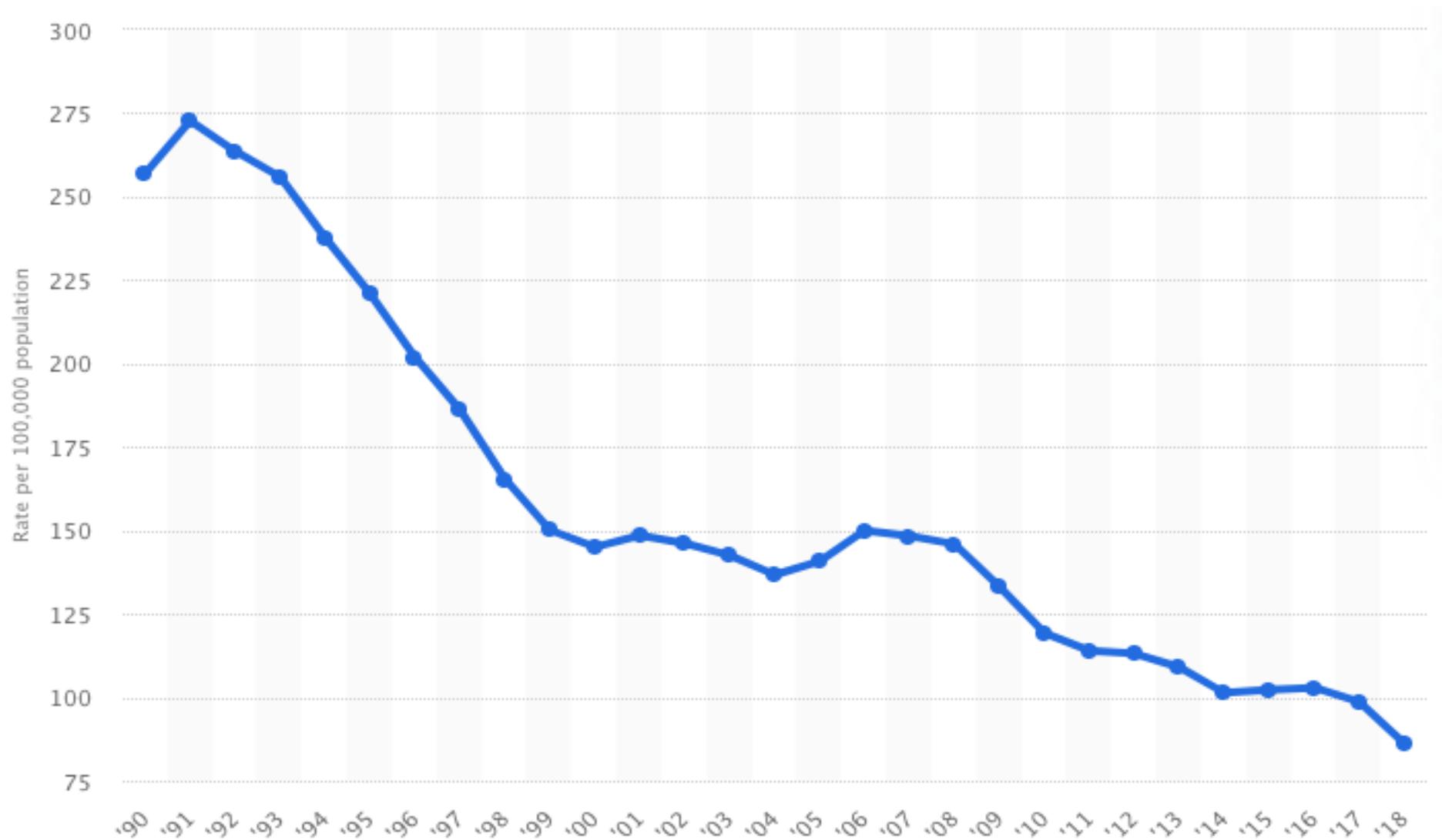


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Societal Goal for Hacking: Robbery Rate in the US



Long-Term Goal for Cybersecurity

To reduce the risk of cyber threats to the point where they no longer represent a significant and present danger to society (like bank robberies).