

Dr. LEVENT ERTAUL

Web: borg.csueastbay.edu/~lertaul/

Teaching

The word "Teaching" is displayed in a playful, colorful font. Each letter is a different color: 'T' is red, 'e' is green, 'a' is blue, 'c' is pink, 'h' is yellow, 'i' is purple, 'n' is red, and 'g' is blue. The letters are held up by several hands of different skin tones, suggesting a multicultural or inclusive theme. The background is plain white.





Where All Your
Possibilities
Come Into View



CALIFORNIA STATE
UNIVERSITY
EAST BAY



CYBER SECURITY

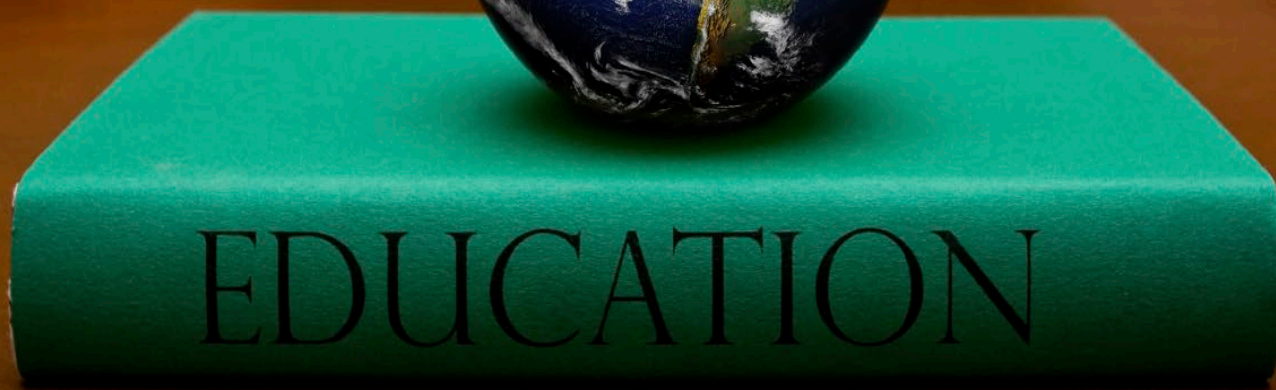


Cryptography



Wireless Security





SCIENCE

1337

LEET

LAME

mark



dork











DOUGLAS ADAMS

The Hitchhiker's Guide to the Galaxy



a novel

PINK
FLOYD











H A B I T S





CYBER SECURITY- PRIVACY

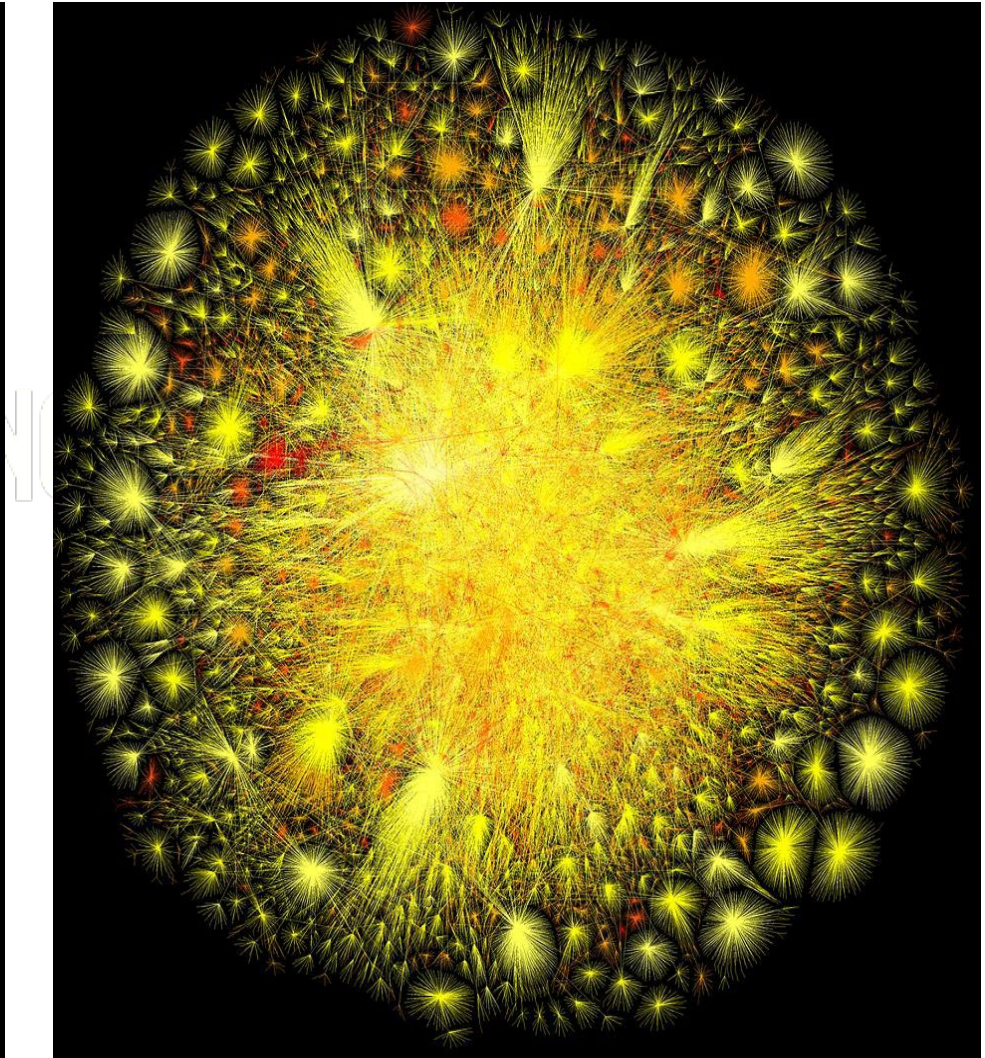
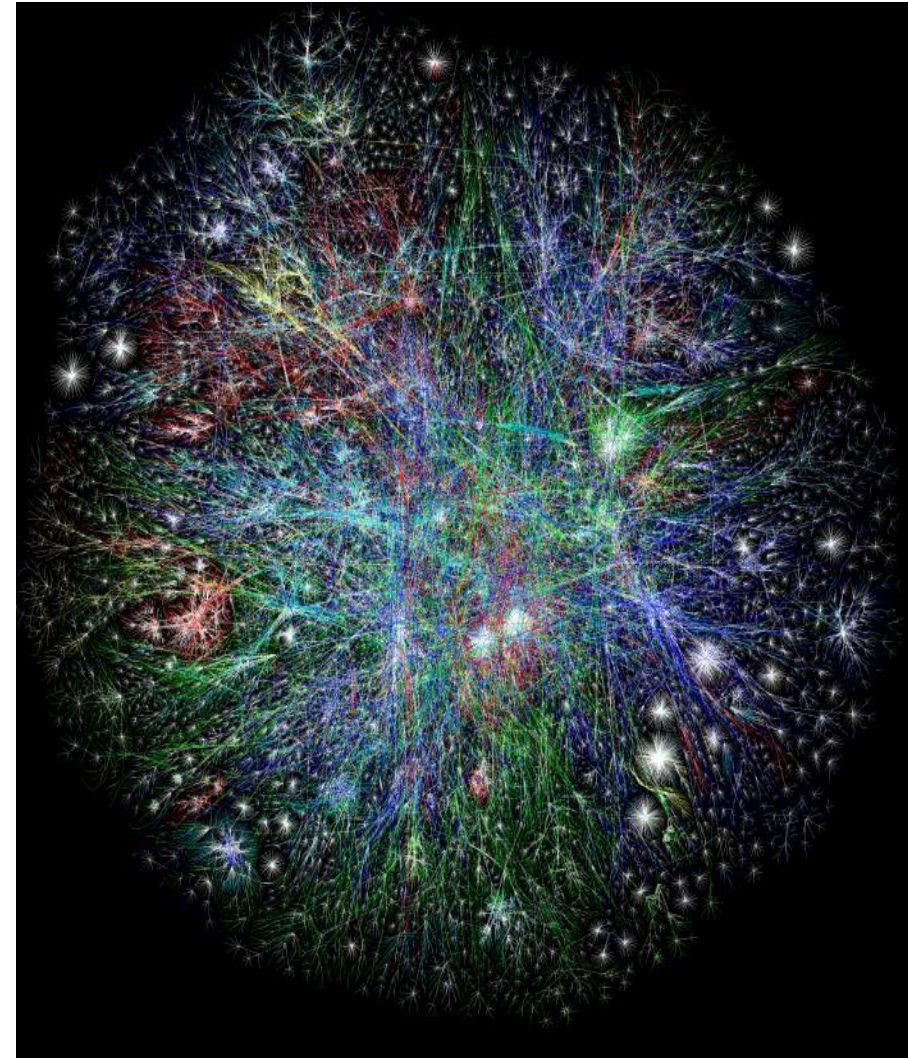
***CAN YOU PROTECT
YOURSELF IN
CYBERSPACE?***

REALLY?????

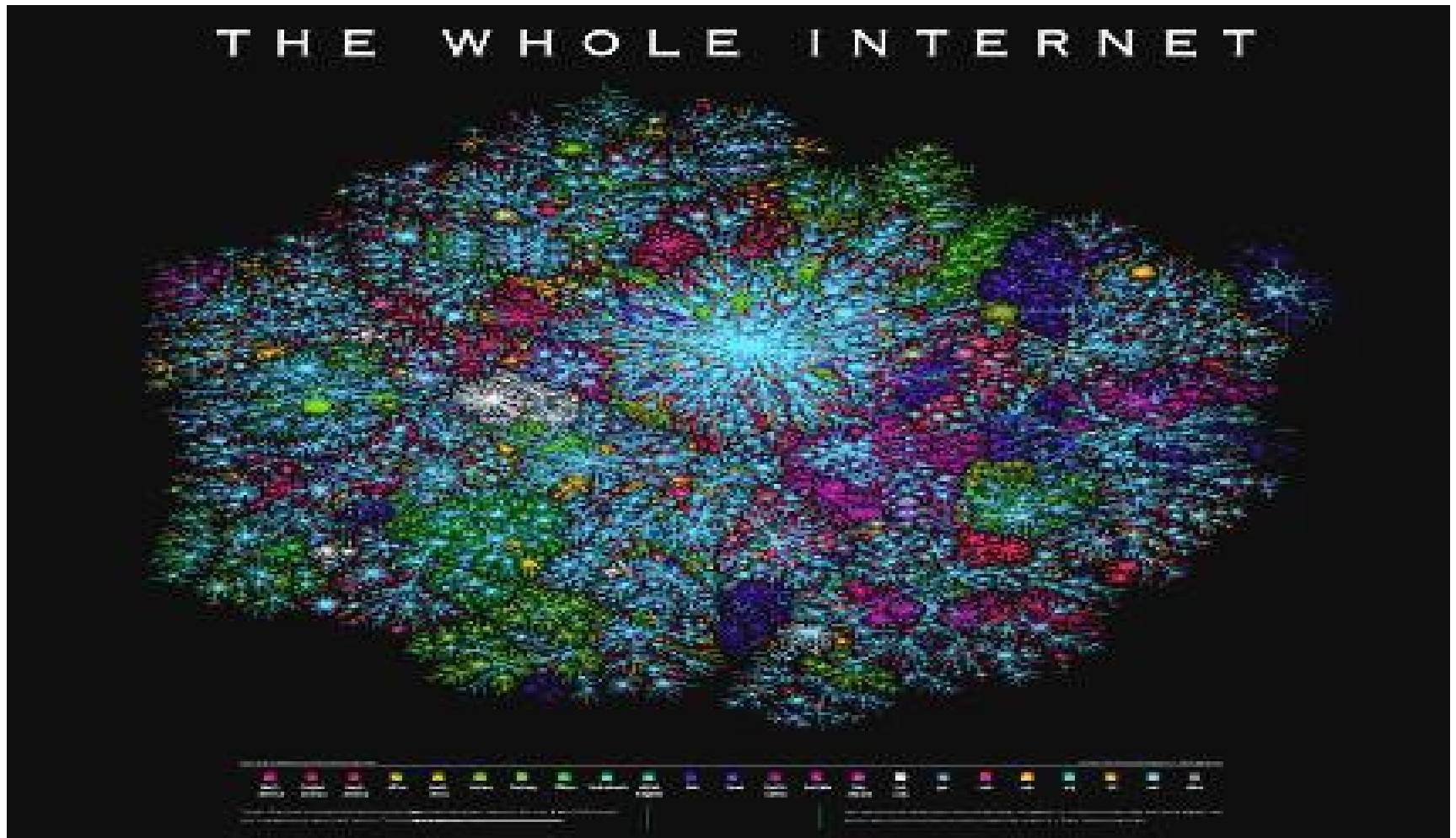
WHO WANTS THE LIVE IN A GLASS HOUSE?



CYBER SPACE



CYBER SPACE: A Dangerous Place?



EVERYTHING is BECOMING A COMPUTER ?

Cyber Space once a virtual abstraction, can now sense and touch
the physical world

Click the following link to kill everybody

WWW.KILL-EVERYBODY.COM



CYBER SECURITY IS NOW BIG BUSINESS?

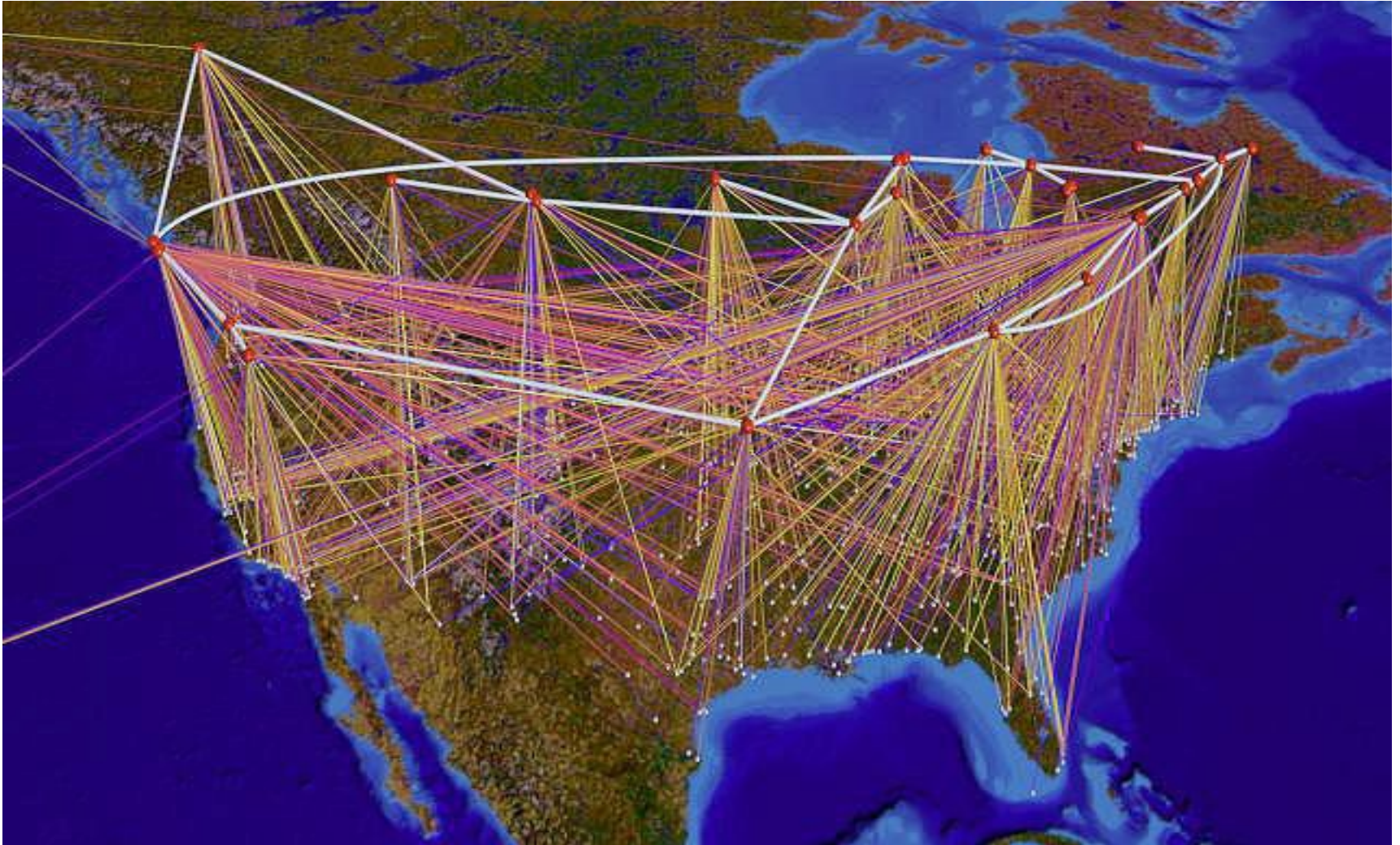
CYBER SCAPE

v2.7

The image displays a vast collection of cybersecurity company logos, organized into a grid of categories. The categories include:

- Network & Infrastructure Security:** Advanced Threat Protection, NAC, SDN, DDoS Protection, DNS Security, Network Firewall, Network Analysis & Forensics, Deception, and Cloud Managed Network.
- Web Security:** Includes companies like Check Point, Cisco, and Palo Alto Networks.
- Endpoint Security:** Divided into Endpoint Prevention (e.g., Avira, Carbon Black) and Endpoint Detection & Response (e.g., CrowdStrike, SentinelOne).
- Application Security:** WAF & Application Security, and Application Security Testing.
- MSSP:** Traditional MSSP and Advanced MSS & MDR.
- Data Security:** Encryption, DLP, Data Privacy, and Data Centric Security.
- Risk & Compliance:** Risk Assessment & Visibility and Security Ratings.
- Security Operations & Incident Response:** SIEM, Security Incident Response, and Security Awareness & Training.
- Threat Intelligence:** Includes companies like Anomali and Blueliv.
- IoT:** IoT Devices, Automotive, and Connected Home.
- Messaging Security:** Includes companies like AGARI and Zix.
- Identity & Access Management:** Authentication, Privileged Management, Identity Governance, and Consumer Identity.
- Digital Risk Management:** Includes companies like OGD and Crisp.
- Security Consulting & Services:** Includes major firms like Accenture, Deloitte, and IBM.
- Blockchain:** Includes companies like Chain and Edge.
- Fraud & Transaction Security:** Includes companies like First Data and Kount.
- Cloud Security:** Includes companies like Aporeto and BetterCloud.
- CASB:** Includes companies like McAfee and Microsoft.

CYBER SPACE: USA's Infrastructure- Partial



CYBER SPACE: China's Infrastructure



CYBER SPACE: Global Traffic

1¢ **14¢** Per-minute wholesale cost to send an international call to Switzerland.
FIXED-LINE MOBILE

27% **TRAFFIC SENT AS VOIP**
 Share of total international voice traffic transported as VoIP by carriers in 2009.

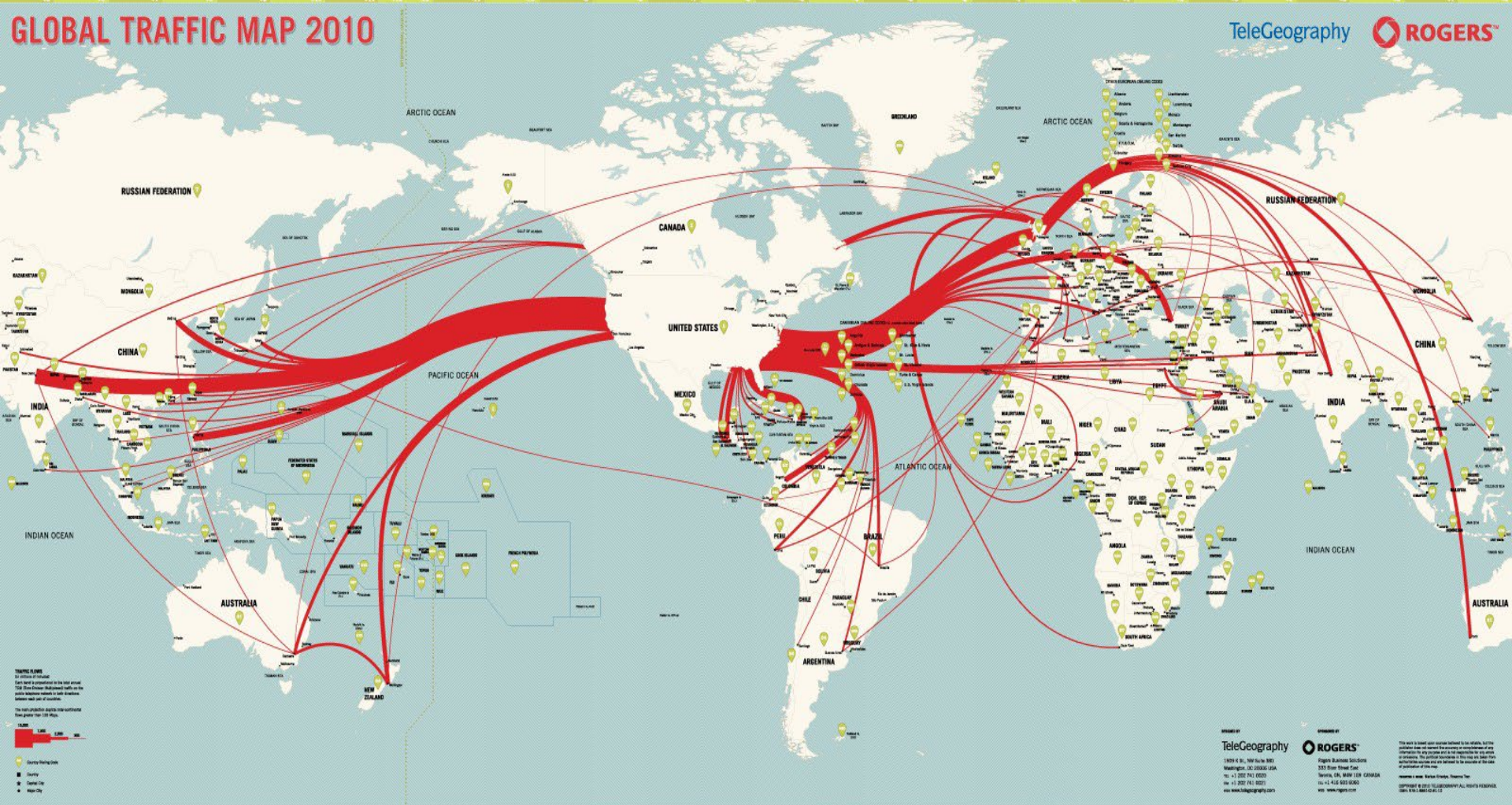
4/5 **WIRELESS WORLD**
 Share of phones worldwide that are mobile.

12% **SKYPE VS. THE WORLD**
 Total international Skype traffic as a percentage of world-wide international voice traffic in 2009, approximately 33 billion minutes.

0.1 **4.1** Billions of new subscribers added since 2000.
FIXED-LINE MOBILE

GLOBAL TRAFFIC MAP 2010

TeleGeography **ROGERS**



TRAFFIC CORRIDORS
 An estimate of global traffic volume is shown by the thickness of the red lines. The thicker the line, the more traffic is sent between the two countries it connects.
 The map includes data for international fixed-line and mobile traffic.

SCALE
 0 1000 2000 Miles
 0 1000 2000 Kilometers

Legend:
 Country (Yellow Pin)
 Country (Yellow Pin)
 State/City (Blue Pin)
 Major City (Red Pin)

ISSUED BY
TeleGeography
 1899 K St., New York, NY 10024
 Headquarters: 212.228.2100 USA
 Tel: +1 212 743 0270
 Fax: +1 212 743 0221
 www.TeleGeography.com

ISSUED BY
ROGERS
 Rogers Business Solutions
 125 King Street East
 Toronto, ON, M5X 1C8 CANADA
 Tel: +1 416 593 5200
 www.rogers.com

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MINUTES & VOLUME
 Voice traffic has grown at a remarkable rate since 2000.

18.7 (2009)

14.9 (2008)

TOP 10 TRAFFIC DESTINATIONS 2009

PRICING & REVENUES
 Thanks to robust competition, international call rates fell.

WHOLESALE TRAFFIC AND REVENUE BY DESTINATION REGION 2009

USA & CANADA

USERS & TECHNOLOGY
 Mobile phones have replaced the traditional landline. Wireless devices...

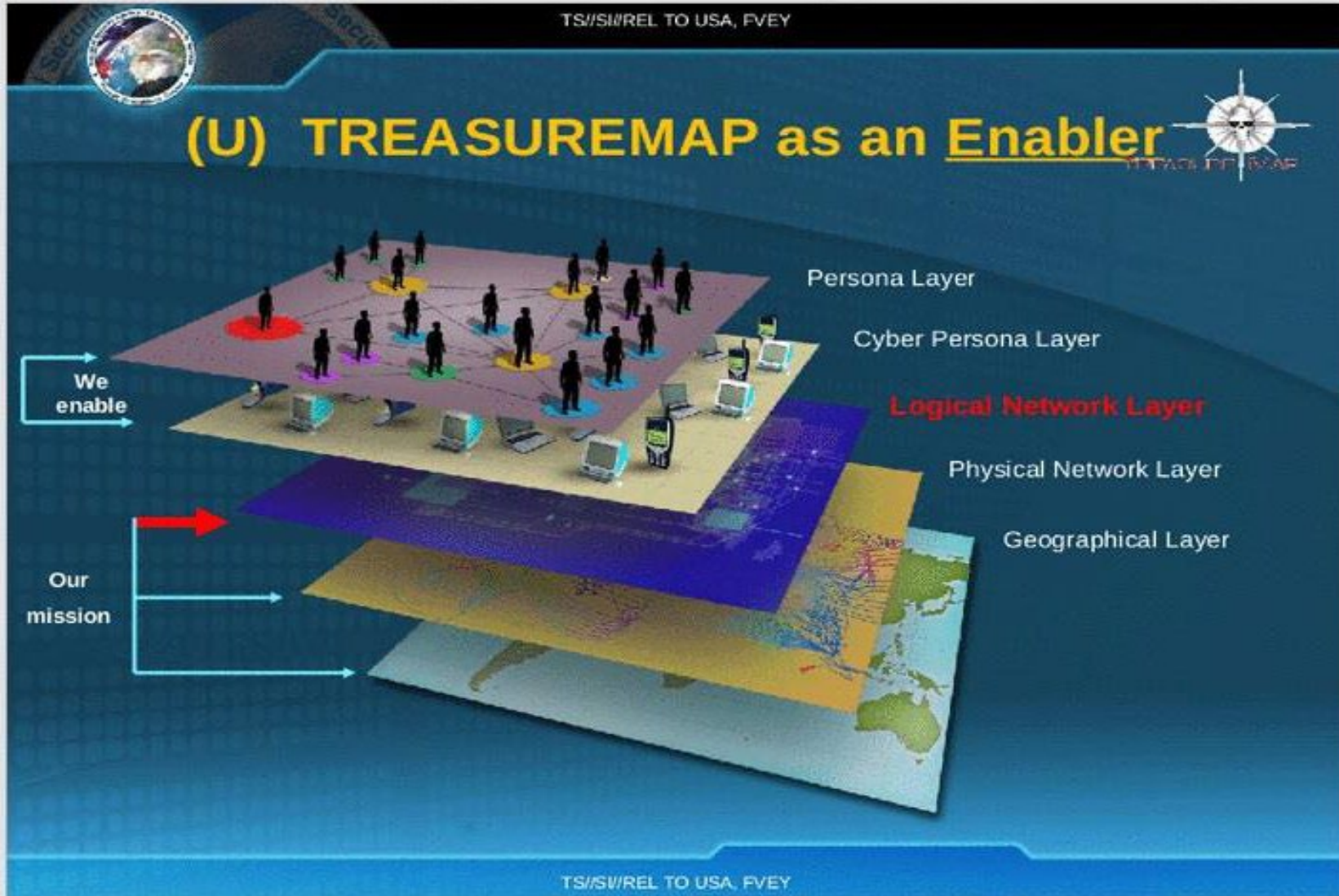
MOBILE AND FIXED SUBSCRIBER GROWTH 2000-09

MOBILE
 0% 5% 10% 15% 20% 25% 30% 35%

SUBSCRIBERS BY TECHNOLOGY 2009

MOBILE

SCOPE OF CYBER SPACE



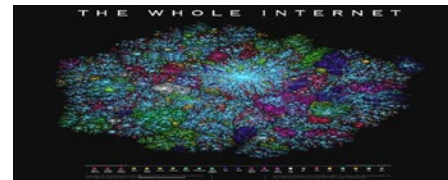
VULNERABILITIES OF CYBER SPACE: Instantaneous Action at a Distance

Asymmetries of Cyber Space

Anonymity



Lack of Borders



Difficulty of Distinction



PRIVACY: Who is after your private

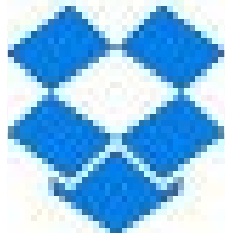
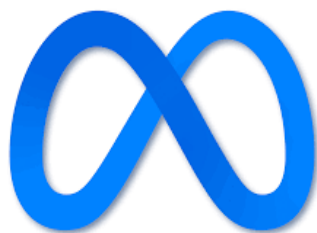
Data

GOVERNMENT



PRIVACY: Who is after your private Data

CORPORATIONS



WE COOPERATE WITH CORPORATE SURVEILLANCE BECAUSE IT PROMISES US CONVENIENCE, AND WE SUBMIT TO GOVERNMENT SURVAILLANCE BECAUSE IT PROMISES US PROTECTION.

PRIVACY: Who is after your private Data

CYBER CRIMINALS

The Cyber criminal community is evolved from Morris Worm to the ransomware and other organized crime that have high payoff, many countries are working to stop such attacks, but these attacks are contiously changing and affecting brutally to our businesses and nation.

Cyber crime and virusses initiated, "Morris Worm" and others.

1997

malicious code,
Trojan,
Advanced worms

2004

Identity theft,
Phishing

2007

DNS attacks,
Rise of Botnets,
Sql attacks,
Anti Spam sites,
Competitive
sobotage
escalation

2010

Social
Engineering,
DoS,
BotNets,
Malicious Email,
Ransomware
attack,
PoS comprised

2013

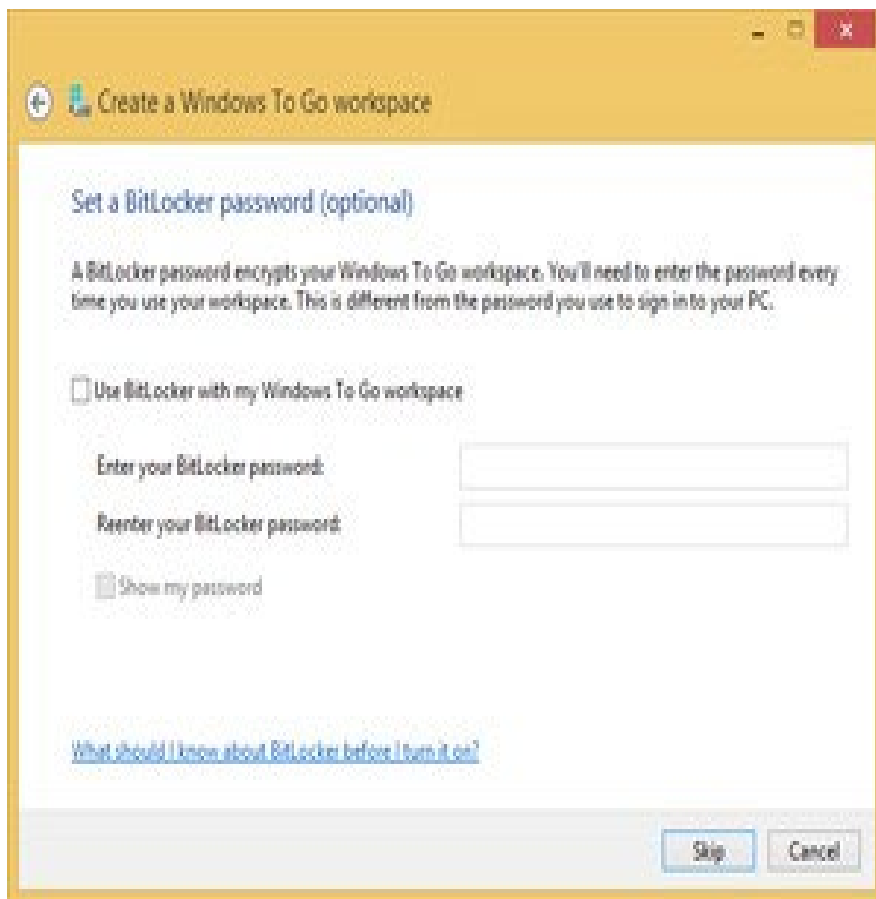
Banking Malware,
Keylogger,
Bitcoin Wallet
Stealer,
Identity Theft,
phone Hijacking,
Ransomware,
PoS attack,
Cyber Warfare,
Android hack etc.

Present



PRIVACY:HOW CAN YOU PROTECT YOURSELF

HDD ENCRYPTION-Bit Locker, PGP



Pretty

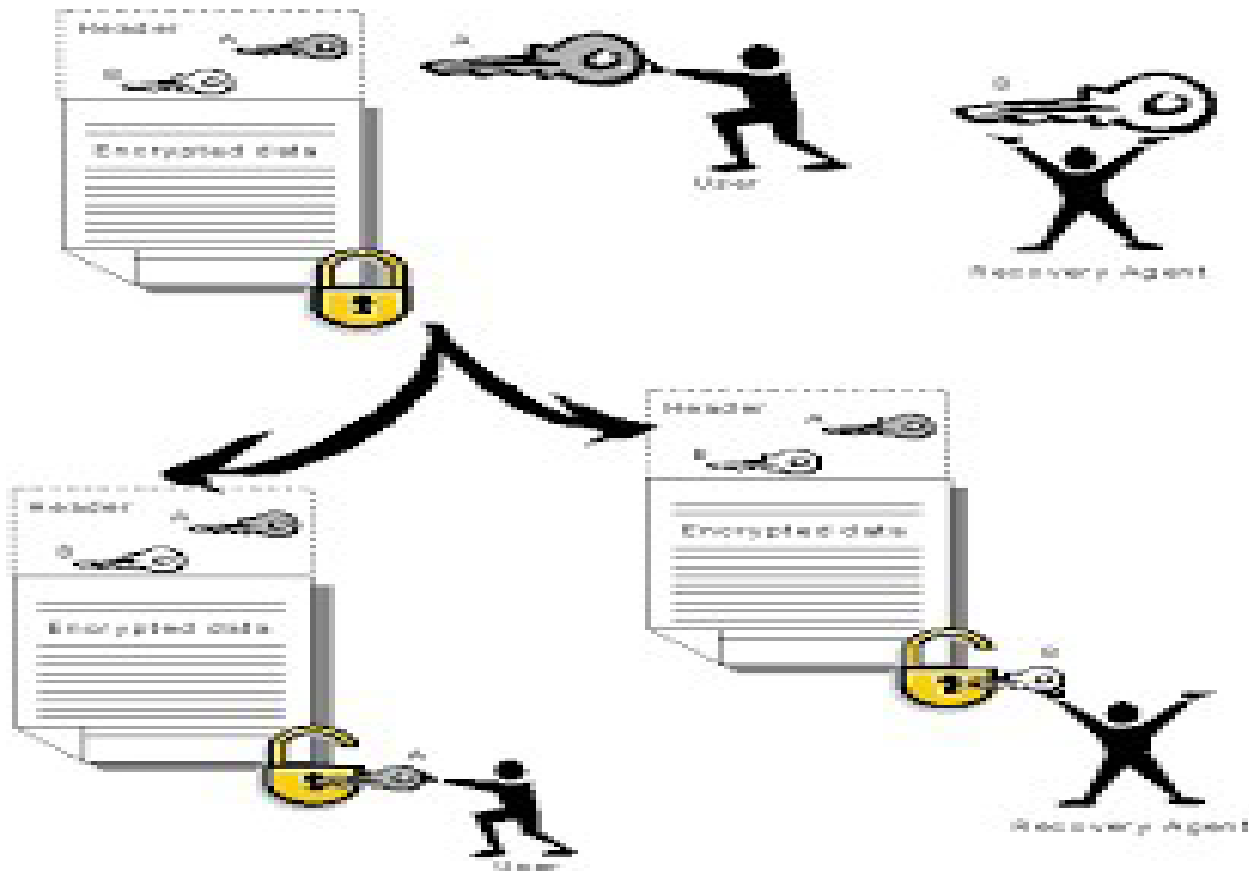
Good

Privacy



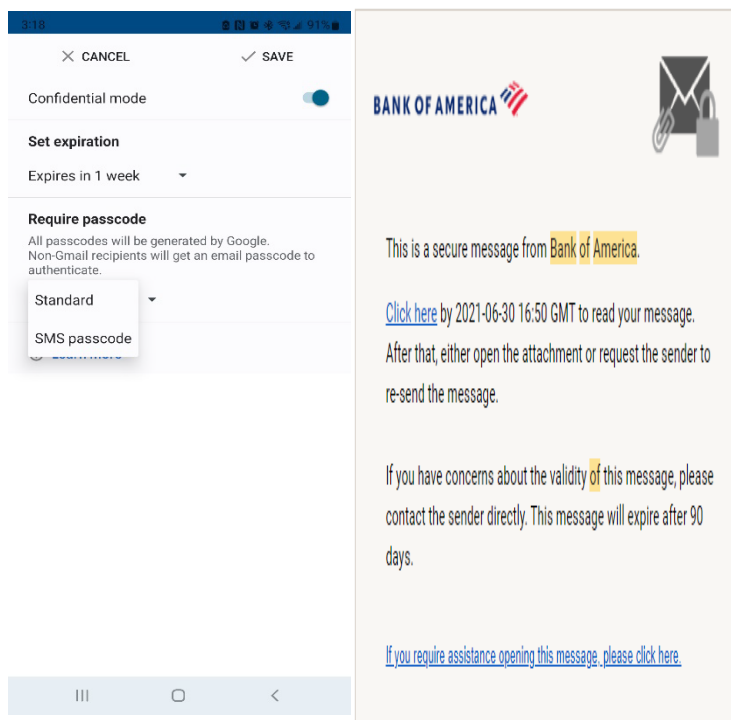
PRIVACY:HOW CAN YOU PROTECT YOURSELF

FILE ENCRYPTION- EFS, FILEVAULT (MAC)



PRIVACY:HOW CAN YOU PROTECT YOURSELF

SECURE E-MAIL: [S-MIME, PGP, MAILVELOPE, GMAIL-CONFIDENTIAL MODE, PROTON MAIL from CERN](#)



Disable auto load images for e-mail to avoid single pixel tracking.

PRIVACY:HOW CAN YOU PROTECT YOURSELF



[“ThrowAwayMail.com”](#)

Provides a randomly generated email

[“10 Minute Mail”](#)

Provides a randomly generated email that shuts down after 10 minutes

Allows you to see emails sent to the address (ex: account verification emails)

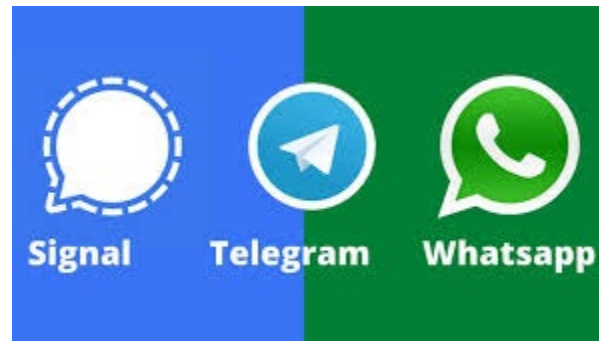
[“SMS Receive Free”](#)

Provides phone numbers that can be used for verification codes, etc.

Each number has its own page, where you can see all messages sent to that number

PRIVACY:HOW CAN YOU PROTECT YOURSELF

Secure Messaging



Which One Should You Choose?

PRIVACY:HOW CAN YOU PROTECT YOURSELF

ANTIVIRUS-MALWARE- SPYWARE-FIREWALLS



PRIVACY:HOW CAN YOU PROTECT YOURSELF

PASSWORD MANAGEMENT- LastPass - Keeper

LastPass 

 keeper[®]

PRIVACY:HOW CAN YOU PROTECT YOURSELF

DELETING DATA- ERASER



PRIVACY:HOW CAN YOU PROTECT YOURSELF

SECURE CLOUD STORAGE- SPIDEROAK



PRIVACY:HOW CAN YOU PROTECT YOURSELF

SECURE PRIVATE BROWSING- TOR



[Home](#)

[About Tor](#)

[Documentation](#)

Anonymity Online

Protect your privacy. Defend yourself against network surveillance and traffic analysis.



[Download Tor](#)

- Tor prevents anyone from learning your location or browsing habits.
- Tor is for web browsers, instant messaging clients, remote logins, and more.
- Tor is free and open source for Windows, Mac, Linux/Unix, and Android.

What is Tor?

Tor is free software and an open network that helps you defend against a form of network

Why Anonymity Matters

Tor protects you by bouncing your

PRIVACY:HOW CAN YOU PROTECT YOURSELF

SECURE PRIVATE SEARCH ENGINE- DUCK DUCK GO



DuckDuckGo



PRIVACY:HOW CAN YOU PROTECT YOURSELF

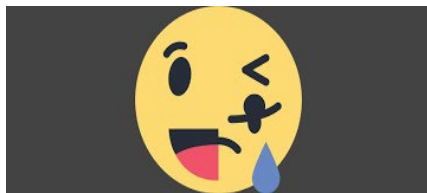
Browser Extensions



AdblockPlus
by eye/o



Privacy Badger



Go Rando



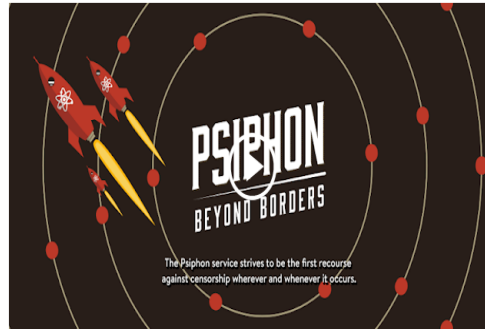
SHODAN



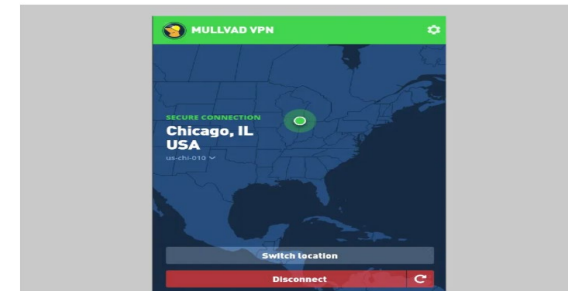
Facebook
Demetricator

PRIVACY:HOW CAN YOU PROTECT YOURSELF

VPNs



PHOTOGRAPH: TUNNEL BEAR
TunnelBear VPN



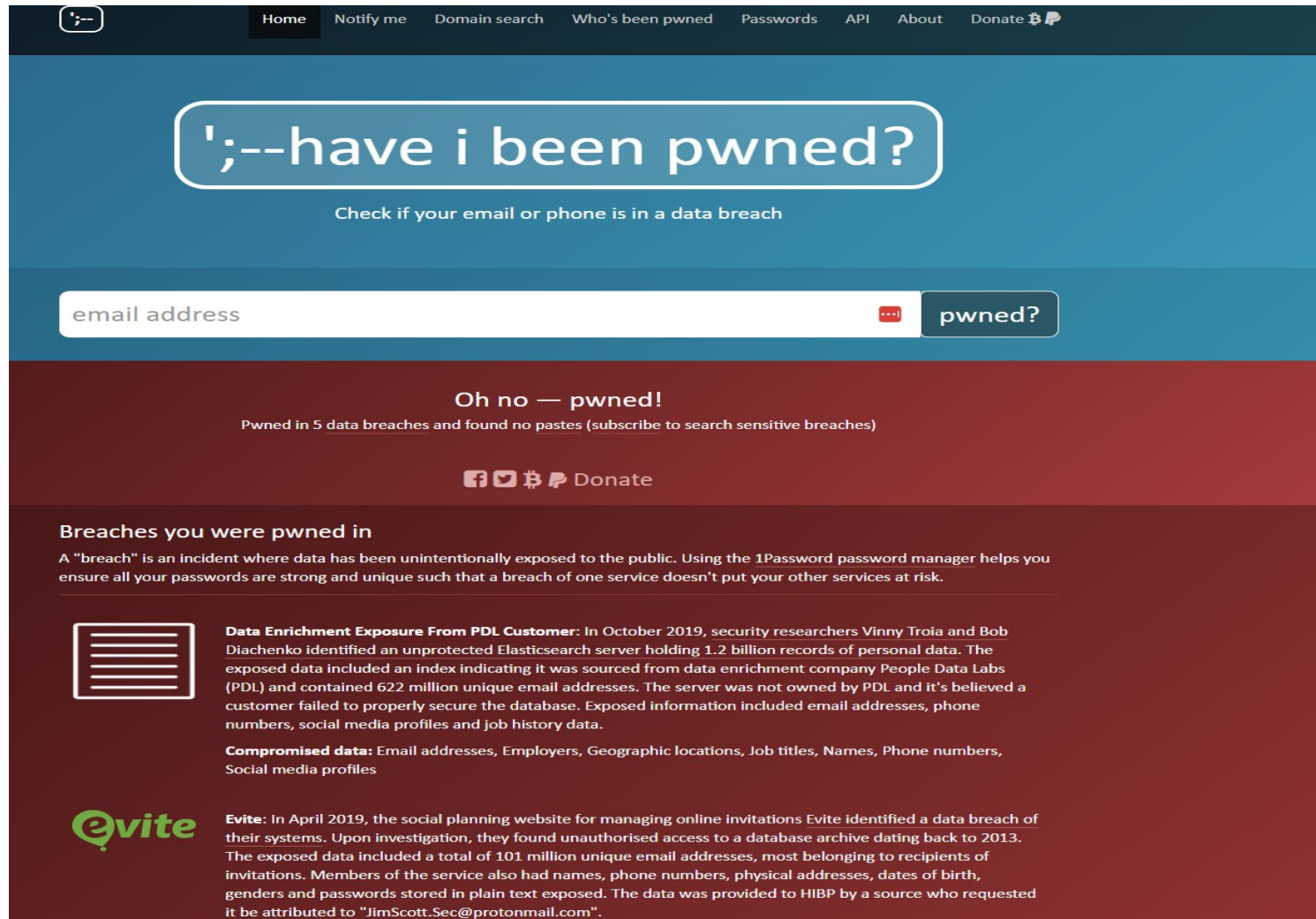
PHOTOGRAPH: SCOTT OLLBERTSON VIA MULLVAD
Mullvad VPN

PRIVACY:HOW CAN YOU PROTECT YOURSELF

MULTIFACTOR AUTHENTICATION (MFA)



';--HAVE I BEEN PWNED



The screenshot shows the 'Have I Been Pwned' website interface. At the top, there is a dark navigation bar with links for Home, Notify me, Domain search, Who's been pwned, Passwords, API, About, and Donate. The main content area has a blue header with the site's logo and the text 'Check if your email or phone is in a data breach'. Below this is a search input field containing 'email address' and a 'pwned?' button. The search results section, which has a dark red background, displays the message 'Oh no — pwned!' and states 'Pwned in 5 data breaches and found no pastes (subscribe to search sensitive breaches)'. There are social media and donation icons. The section 'Breaches you were pwned in' includes a definition of a breach and two detailed examples: 'Data Enrichment Exposure From PDL Customer' and 'Evite'.

Home Notify me Domain search Who's been pwned Passwords API About Donate

';--have i been pwned?

Check if your email or phone is in a data breach

email address

Oh no — pwned!
Pwned in 5 data breaches and found no pastes (subscribe to search sensitive breaches)

[Facebook](#) [Twitter](#) [Bitcoin](#) [PayPal](#) Donate

Breaches you were pwned in

A "breach" is an incident where data has been unintentionally exposed to the public. Using the 1Password password manager helps you ensure all your passwords are strong and unique such that a breach of one service doesn't put your other services at risk.

Data Enrichment Exposure From PDL Customer: In October 2019, security researchers Vinny Troia and Bob Diachenko identified an unprotected Elasticsearch server holding 1.2 billion records of personal data. The exposed data included an index indicating it was sourced from data enrichment company People Data Labs (PDL) and contained 622 million unique email addresses. The server was not owned by PDL and it's believed a customer failed to properly secure the database. Exposed information included email addresses, phone numbers, social media profiles and job history data.

Compromised data: Email addresses, Employers, Geographic locations, Job titles, Names, Phone numbers, Social media profiles

Evite: In April 2019, the social planning website for managing online invitations Evite identified a data breach of their systems. Upon investigation, they found unauthorised access to a database archive dating back to 2013. The exposed data included a total of 101 million unique email addresses, most belonging to recipients of invitations. Members of the service also had names, phone numbers, physical addresses, dates of birth, genders and passwords stored in plain text exposed. The data was provided to HIBP by a source who requested it be attributed to "JimScott.Sec@protonmail.com".

<https://haveibeenpwned.com/>

PRIVACY:HOW CAN YOU PROTECT

YOURSELF

Anti Facial Recognition
Dressing for Surveillances Age

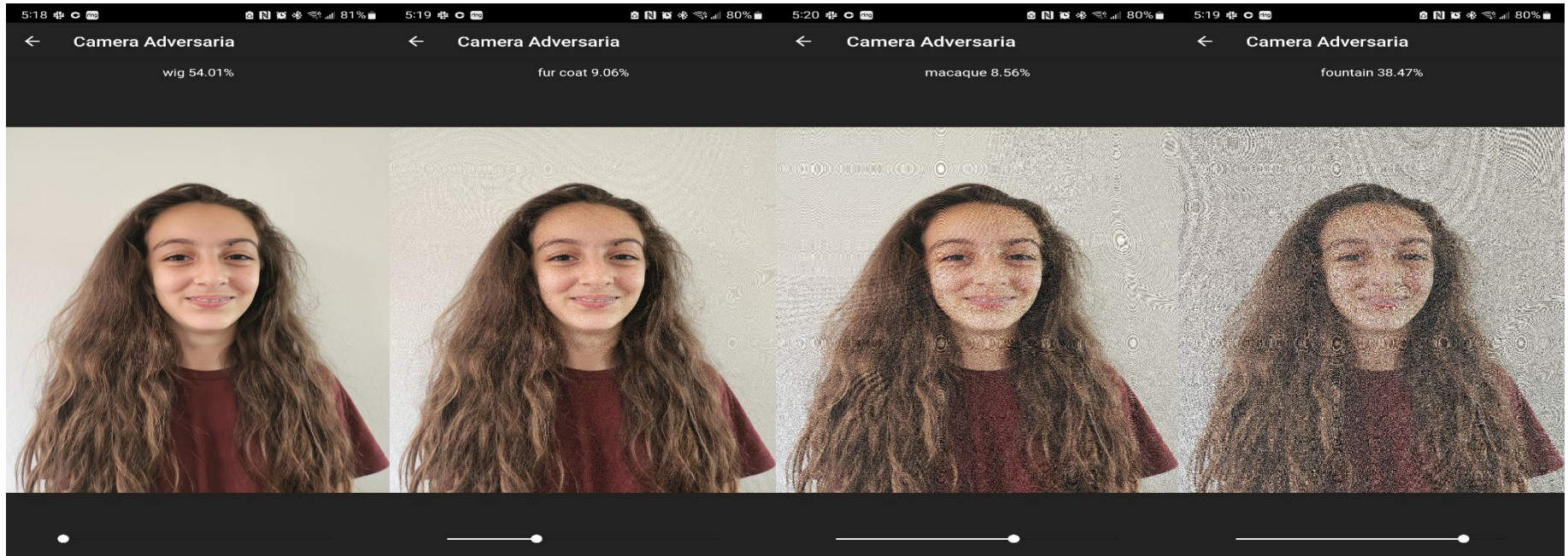


PRIVACY:HOW CAN YOU PROTECT YOURSELF

Anti Facial Recognition



CAMERA ADVERSARIA



PRIVACY:HOW CAN YOU PROTECT YOURSELF

SECURE WIRELESS CONNECTION-WPA2

The screenshot shows a web browser window displaying a router's configuration page. The browser's address bar shows the URL `0.1/wireless_network_configuration_edit.asp`. The page title is "Private WiFi Network Configuration (2.4 GHz)".

On the left side, there is a navigation menu with the following items: Status, XFINITY Network, Local IP Network, **Wi-Fi**, Firewall, Software, Hardware, Wizard, Connected Devices, Parental Control, Advanced, and Troubleshooting.

The main configuration area includes the following settings:

- Wireless Network: Enabled Disabled
- Network Name (SSID): L1A0R1A0
- Mode: 802.11 g/n
- Security Mode: WPAWPA2-PSK (TKIP/AES) (recommended) (selected in a dropdown menu)
- Channel Selection: (dropdown menu)
- Channel: (dropdown menu)
- Network Password: (text input field)
- Show Network Password:
- Broadcast Network Name (SSID): Enabled

At the bottom of the configuration area, there are two buttons: "SAVE SETTINGS" and "RESTORE DEFAULT SETTINGS".

A note at the bottom of the page states: "WPA2 requires a 8-63 ASCII character or a 64 hex character password. Hex means only the following characters can be used: ABCDEF0123456789."

PRIVACY:HOW CAN YOU PROTECT YOURSELF



STOP | THINK | CONNECT™

<https://www.stopthinkconnect.org/>



<https://www.lockdownyourlogin.com/>

StaySafeOnline

Powered by: National Cyber Security Alliance

<https://staysafeonline.org/>



<https://www.dhs.gov/see-something-say-something>

THE CONSTITUTION AND CYBERSPACE

FOURTH AMENDMENT

The Fourth Amendment of the U.S. Constitution provides, "[t]he right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized."

The ultimate goal of this provision is to protect people's right to privacy and freedom from arbitrary governmental intrusions.

The protection under the Fourth Amendment can be waived if one voluntarily consents to or does not object to evidence collected during a warrantless search or seizure.

Private intrusions not acting in the color of governmental authority are exempted from the Fourth Amendment.

GOOGLE PRIVACY POLICY



<https://myaccount.google.com/>

<https://safety.google/privacy/privacy-controls/>

DATA COLLECTED BY APPS: EXAMPLE



chrome

Take pictures and videos

Record audio

Location information (Approximate, Precise)

Read your Web bookmarks and history

Modify or delete contents of your SD card

Control NFC

Add or remove accounts

Change your audio settings

Read sync settings

Install shortcuts

Access Mobile Device Management (MDM) content providers

GDPR: Global Data Privacy Regulations



- Increased Territorial Scope
- Penalties up to 4% revenue or 20 Million Euro
- Consent must be intelligible and accessible
- Breach notification 72 hours
- Right of access – free copy
- Right to be forgotten
- Data Portability
- Privacy By Design
- Data Protection Officers requirements



CISO SPOTLIGHT, LLC

Trusted Cybersecurity
and Privacy Training

RSAConference2018

CCPA: California Consumer Privacy Act

- Right to know all data collected by a business on you.
- Right to say NO to the sale of your information.
- Right to DELETE your data.
- Right to be informed of what categories of data will be collected about you prior to its collection, and to be informed of any changes to this collection.
- Mandated opt-in before sale of children's information (under the age of 16).
- Right to know the categories of third parties with whom your data is shared.
- Right to know the categories of sources of information from whom your data was acquired.
- Right to know the business or commercial purpose of collecting your information.
- Enforcement by the Attorney General of the State of California.
- Private right of action when companies breach your data, to make sure these companies keep your information safe.

PRIVACY REGULATIONS APPEAR AROUND THE WORLD



- General Data Protection Regulation (GDPR)
- California Consumer Privacy Act (CCPA)
- California Privacy Rights Act (CPRA)
- Virginia Consumer Data Protection Act (VCDPA)
- Colorado Privacy Act (CPA)
- Utah Consumer Privacy Act (UCPA)
- Connecticut Data Privacy Act (CTDPA)
- Iowa Privacy Bill
- Brazil's General Data Privacy Law (LGPD)
- Upcoming: Australia
- Upcoming: India
- Upcoming: Canada

PRIVACY REGULATIONS IN USA

47%

of Californian online adults have exercised their CCPA right to ask companies to stop selling their data

30%

of Californian online adults have asked to be forgotten

Q: Which of the following best describes your use of these CCPA rights?

Base: 630 Online adults in California

Source: [Forrester's Media And Marketing Benchmark Recontact Survey, 2022](#)

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137

out of 194 countries have put in place legislation to secure the protection of data and privacy.

Source: <https://unctad.org/page/data-protection-and-privacy-legislation-worldwide>

FORRESTER®

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Should you "Opt-Out"

In certain circumstances, you can tell a company not to share the unique information it has on file for you. You do this by choosing to "opt out." Here are a few "opt outs" recommended by the World Privacy Forum. The World Privacy Forum's "Top Ten Opt Outs" are found at <http://worldprivacyforum.org/2013/08/consumer-tips-top-ten-opt-outs>.

Reduce Calls from Telemarketers

The National Do Not Call Registry

www.donotcall.gov

1-888-382-1222

The National Do Not Call Registry gives you a choice about whether to receive telemarketing calls at home or on your cell phone. Once your number has been on the registry for 31 days, telemarketers should not call, and you can file a complaint if they do. Registration of the number does not expire.

Reduce Pre-approved Credit and Insurance Offers

OptOutPrescreen.com

www.optoutprescreen.com

1-888-567-8688

Reduce pre-approved credit card offers and insurance solicitations delivered by postal mail by visiting this official site of the Consumer Credit Reporting Industry, which allows you to opt in or opt out of firm offers of credit or insurance.

Reduce Email Advertisements (CAN-SPAM)

The federal CAN-SPAM Act requires commercial organizations to provide recipients of email advertisements with a way to opt out of receiving emails in the future.

To opt out, the World Privacy Forum offers this direction:

- Check to make sure the email is CAN-SPAM-compliant, as some emails offer false opt outs. Here are three ways you can tell the difference.
 1. A CAN-SPAM-compliant email will be labeled as an advertisement.
 2. It will include a valid postal address for the sender.
 3. **It will include a workable opt-out link of some type.**
- Then use the link provided or send the request by postal mail. You will likely be asked to provide your email address but shouldn't be asked for sensitive personal information.

Reduce Marketing Mail and Catalogs

The Direct Marketing Association's opt-out services can be accessed by visiting www.dmachoice.org. This website enables you to manage the mail you receive from members of the Direct Marketing Association, whether it's delivered by postal mail or email.

NFC ON

Leaving NFC on may put your privacy at risk and Increase your risk of payment fraud.

TRUTH or LIE



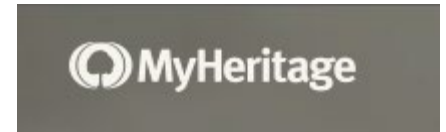
[FACTCHECK.ORG](https://www.factcheck.org)[®] *A Project of The Annenberg
Public Policy Center*



DEEP FAKE, AI, CHAT GPT, FUTURE



LensaAI



Reface

DeepFaceLab



Deep Art AI



FaceApp

DEEP FAKE, AI, CHAT GPT, FUTURE



DEEP FAKE, AI, CHAT GPT, FUTURE-2



AI TSUNAMI

Internet Era

Compliance-First

Security
Convenience

Mobile/Cloud

Convenience-First

Security
Compliance

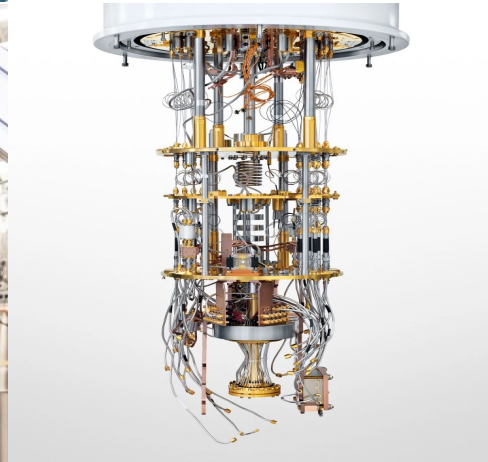
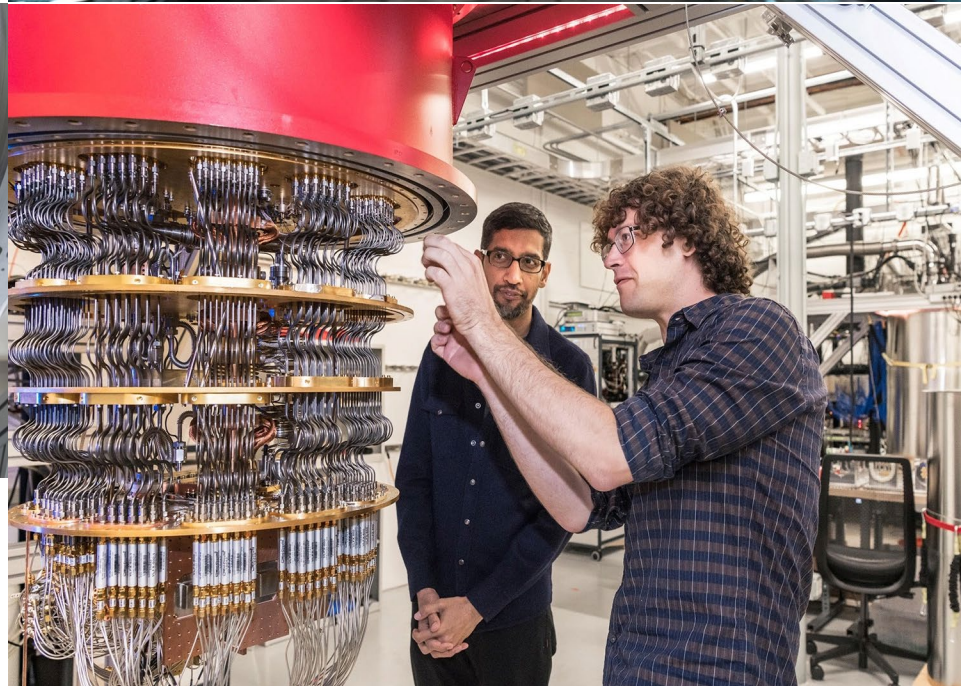
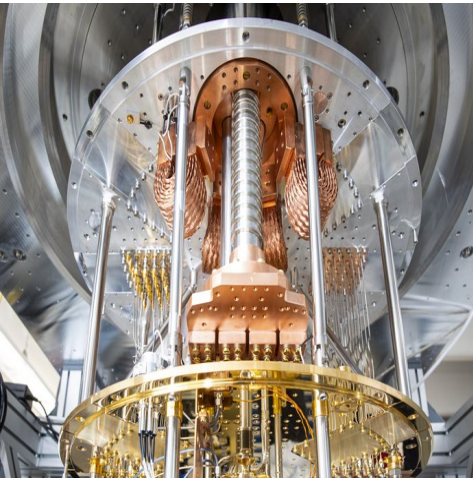
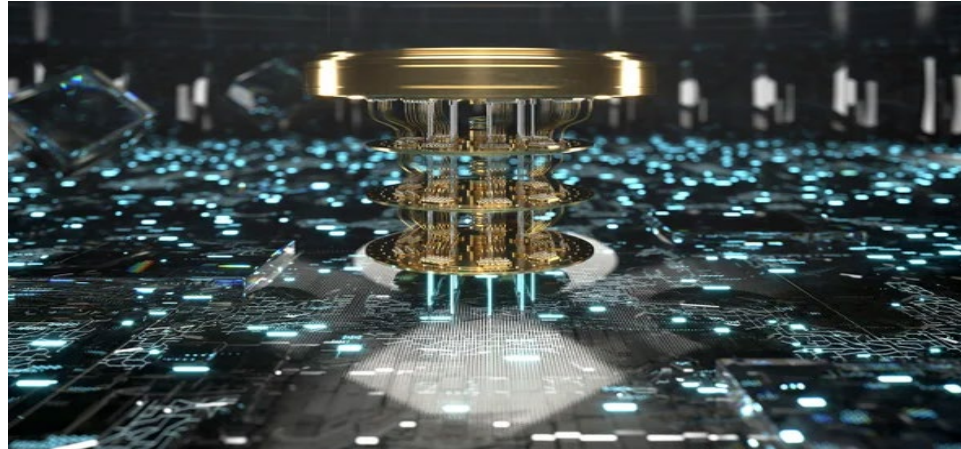
AI/Data

Security-First

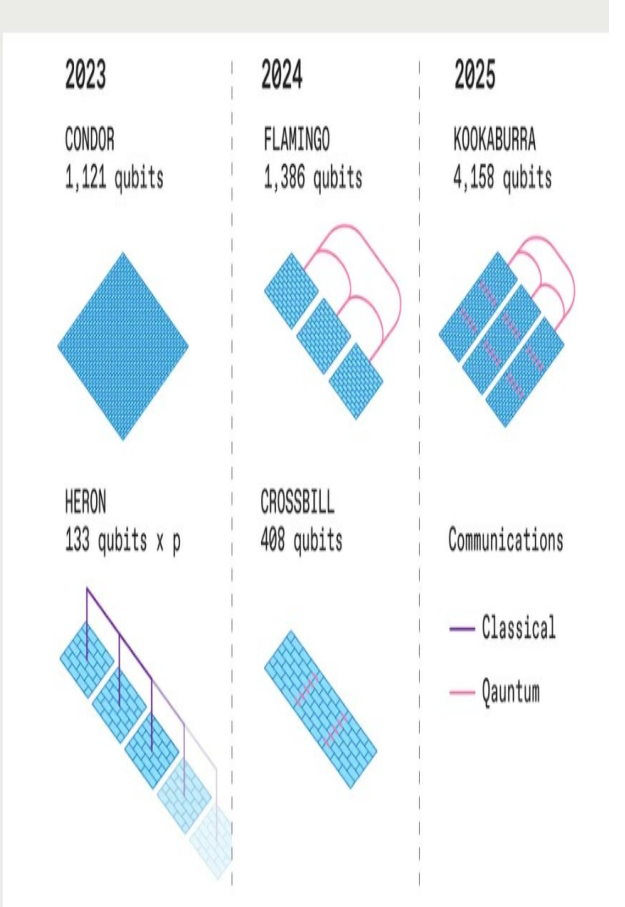
Convenience
Compliance



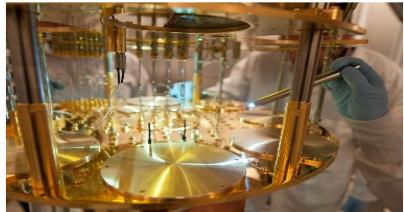
Are Quantum Computers about to Break Online Privacy?



Are Quantum Computers about to Break Online Privacy?



IBM expects to build quantum computers of increasing complexity over the next few years, starting with those that use the Condor processor or multiple Heron processors in parallel. CARL DE TORRES/IBM



Berkeley Quantum Synthesis Toolkit (BQSKit)

BQSKit is a superoptimizing quantum compiler and research vehicle that combines ideas from several projects at Berkeley Lab into an easily accessible and quickly extensible software suite.

D-Wave's 500-Qubit Machine Hits the Cloud

Experimental prototype offers sneak peek of 7,000-qubit quantum computer

BY CHARLES Q. CHOI | 07 JUL 2022 | 4 MIN READ | 0

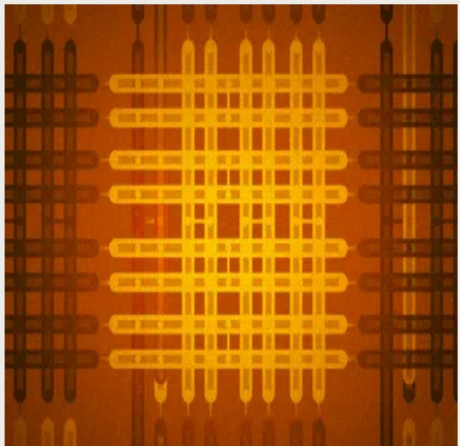
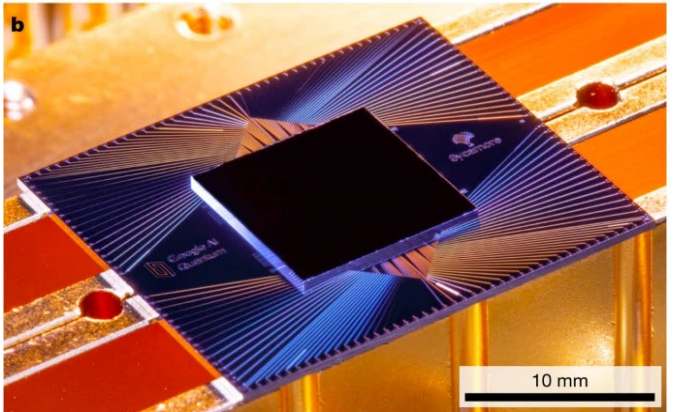
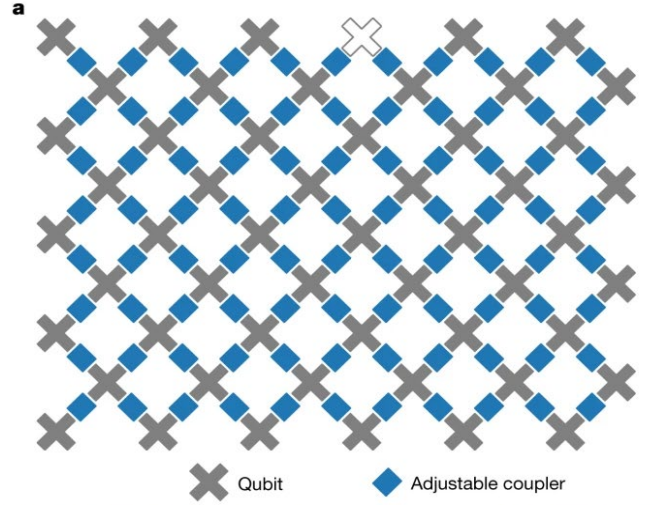


fig. 1: The Sycamore processor.



a. Layout of processor, showing a rectangular array of 54 qubits (grey), each connected to its four nearest neighbours with couplers (blue). The inoperable qubit is outlined. b. Photograph of the Sycamore chip.

HACKING THE BRIAN ???

Photographing a Dream?



Placing the brain in an MRI machine can yield 30,000 points of blood flow.

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HACKING THE BRIAN ???



NEUROSCIENCE

Neuroscientists Re-create Pink Floyd Song from Listeners' Brain Activity

Artificial intelligence has turned the brain's electrical signals into somewhat garbled classic rock

CONCLUSIONS

“I AM REGULARLY ASKED WHAT THE AVERAGE INTERNET USER CAN DO TO ENSURE HIS SECURITY. MY FIRST ANSWER IS USUALLY ‘NOTHING; YOU’RE SCREWED’.”

BRUCE SCHNEIER