

Practical Cybersecurity

or . . . The internet is a dumpster fire – what can I do to protect myself from hackers and scams?

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Associate Vice President for IT Security and Identity

Virginia Tech

raymondd@vt.edu



VIRGINIA CYBER RANGE

Disclaimers

- These are my thoughts and opinions – not those of my employers
- Everything I say will be factual* – don't shoot the messenger!
- I'm a computer guy - I'm not giving investment advice!

*Barring any honest mistakes!



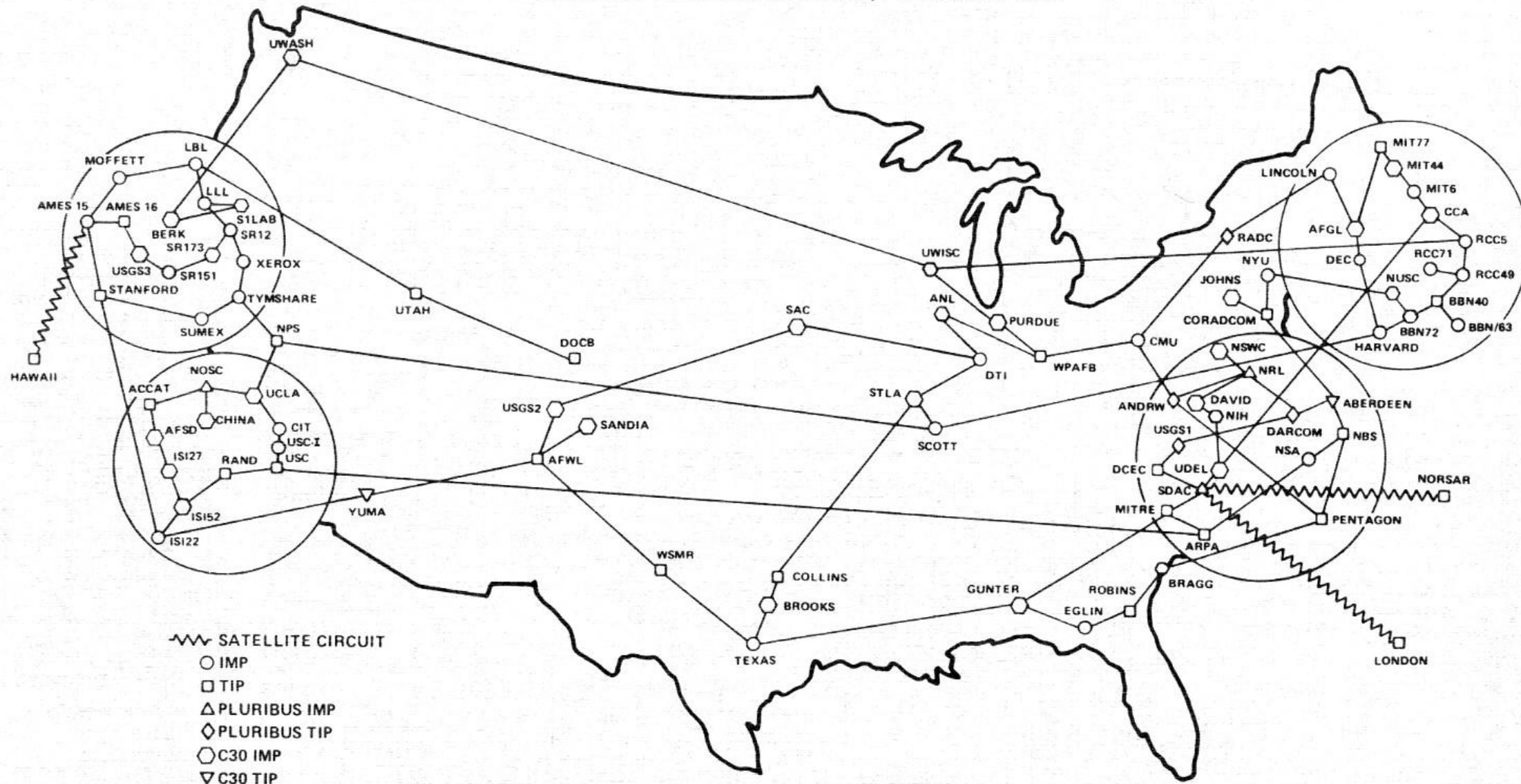
VIRGINIA
CYBER RANGE



The ARPANET in December 1969

**TCP/IP developed in the 1970s
by Vinton Cerf and Bob Kahn**

ARPANET GEOGRAPHIC MAP, FEBRUARY 1982





Mailbox is '/var/mail/root' with 2 messages [ELM 2.5 PL6]

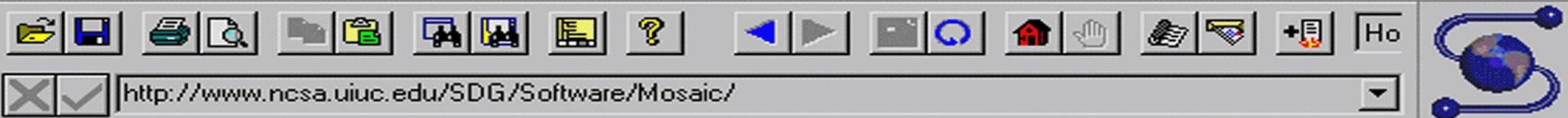
| | | | |
|---|--------|--------------------------|------------------------------------|
| 1 | Sep 17 | Patrick J. Volkerd (174) | Welcome to Linux (Slackware 9.1)! |
| 0 | Sep 17 | (45) | Register with the Linux counter pr |

You can use any of the following commands by pressing the first character:
d)elete or u)ndelete mail, m)ail a message, r)eply or f)orward mail, q)uit

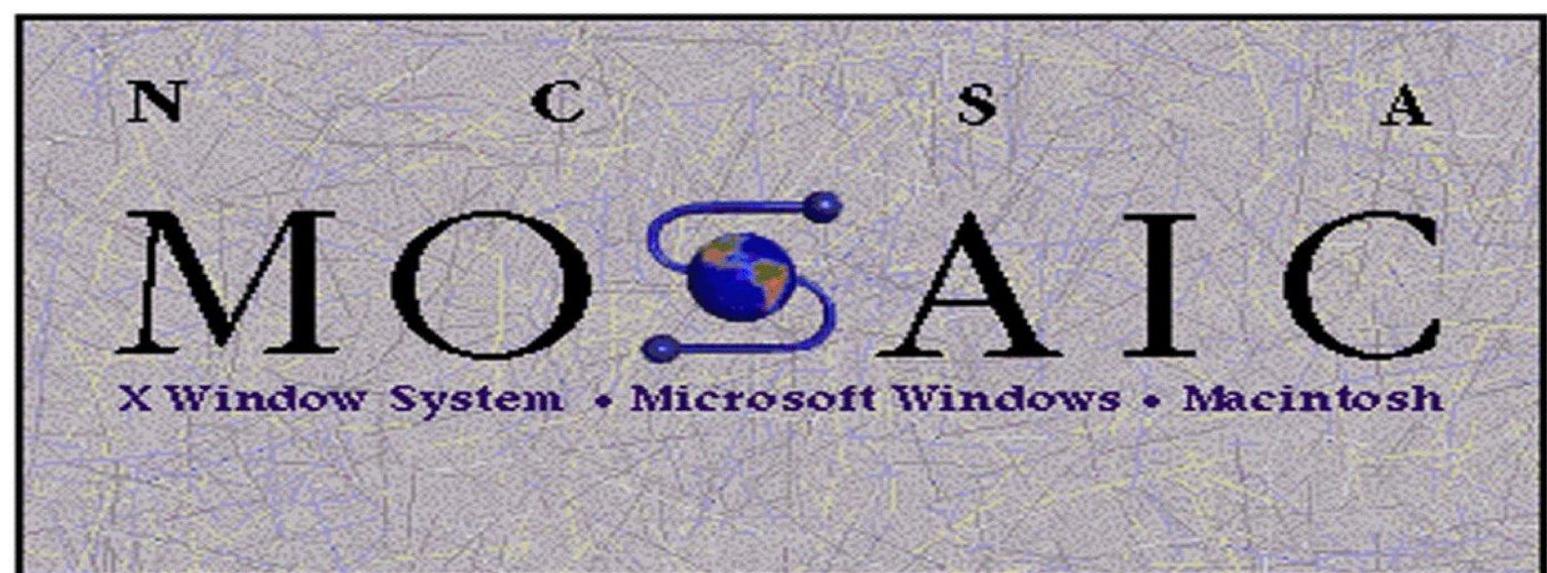
To read a message, press <return>. j = move down, k = move up, ? = help

Command:

File Edit Source Manager View Navigate Tools Hotlists Help



<http://www.ncsa.uiuc.edu/SDG/Software/Mosaic/>



Welcome to NCSA Mosaic, an Internet information browser and [World Wide Web](#) client. NCSA Mosaic was developed at the [National Center for Supercomputing Applications](#) at the [University of Illinois](#) in Urbana-Champaign. NCSA Mosaic software is [copyrighted](#) by The Board of Trustees of the University of Illinois (UI), and ownership remains with the UI.



Location: about:

[What's New!](#) [What's Cool!](#) [Handbook](#) [Net Search](#) [Net Directory](#) [Software](#)

Netscape NavigatorTM

Version 2.01

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JAVA COMPATIBLE

Contains JavaTM software developed by Sun Microsystems, Inc.
Copyright © 1992-1995 Sun Microsystems, Inc. All Rights Reserved.



Document: Done





MAKE LOVE
NOT MONEY



Online Banking

Login:

Password:

Security Code:

SU











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Life is short. Have an affair.®

Get started by telling us your relationship status:

Please Select

[See Your Matches »](#)

Over **38,855,000** anonymous members!



As seen on: BBC News,
Reuters, The Sun, The
Telegraph, The Times

Ashley Madison is the
world's leading married
dating service for
discreet encounters



Trusted
Security
Award



SSL
Secure
Site



[Register on Ashley Madison](#) [Affiliate Program](#) [Press](#) [FAQ](#) [Guarantee](#) [Blog](#) [Infidelity News](#) [Articles](#) [Terms](#) [Privacy](#) [Contact Us](#)

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4 0389

NO
HAZARDOUS
MATERIAL
ALLOWED

WM
WASTE MANAGEMENT
604-520-7800
WWW.WM.COM

The Cost of Cybercrime

Cybercrime Damages*

\$9 Trillion in 2024

Could be \$16 Trillion by 2029

Ransomware Costs**

\$1.25 Billion in 2023

Cybercrime Statistics***

- Half of all Americans had an account breached in 2021**
- Data breaches cost US companies an average of \$4.35M in 2023**
- Romance scams cost Americans \$956M in 2021**

* "Estimated cost of cybercrime worldwide 2018-2029", Statista, <https://www.statista.com/forecasts/1280009/cost-cybercrime-worldwide>

** Chainalysis, <https://www.chainalysis.com/blog/crypto-crime-ransomware-victim-extortion-2025/>

*** "The Latest 2025 Cyber Crime Statistics", AAG, <https://aag-it.com/the-latest-cyber-crime-statistics/>









Case Studies

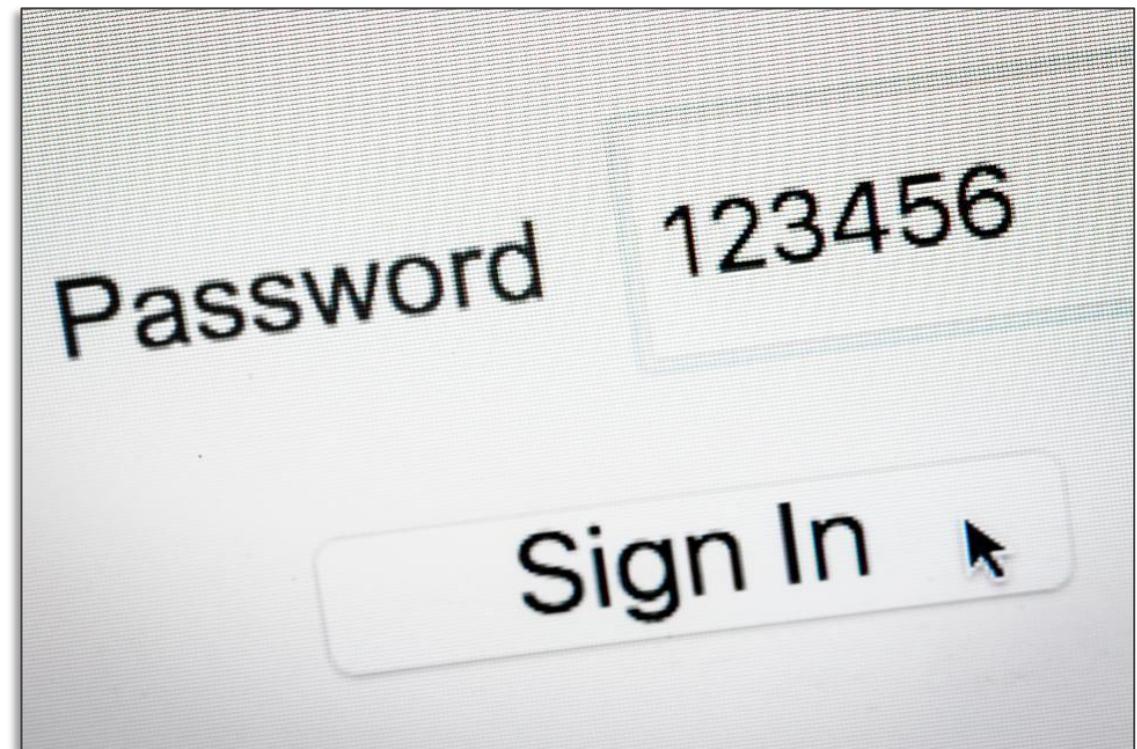


Q: What do
these people
have in common?
A: They reused
their passwords!



24 Most Common Passwords of 2024

| | |
|--------------|---------------|
| 1. 123456 | 13. welcome |
| 2. password | 14. monkey |
| 3. 12345 | 15. login |
| 4. 12345678 | 16. qwerty123 |
| 5. Qwerty | 17. dragon |
| 6. 123456789 | 18. master |
| 7. 1234 | 19. sunshine |
| 8. 111111 | 20. ashley |
| 9. 1234567 | 21. bailey |
| 10. abc123 | 22. passw0rd |
| 11. iloveyou | 23. shadow |
| 12. admin | 24. 123123 |



';-have i been pwned?

Check if you have an account that has been compromised in a data breach

pwned?

Generate secure, unique passwords for every account

[Learn more at 1Password.com](#)

[Why 1Password?](#)

312
pwned websites

5,421,711,825
pwned accounts

78,950
pastes

86,251,942
paste accounts

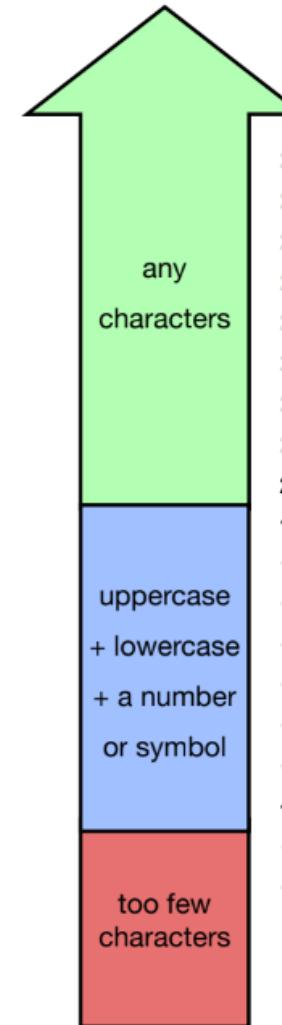
Use good passwords!

What is good?

- Longer is better! Use a passphrase
abirdinthehandisworthtwointhebush
- If shorter, add special characters and numbers
- Don't use dictionary words alone
- Don't use predictable passwords
 - Hokies2025!
 - B@ndit
- Can't remember them? Write them down!

Division of Information
Technology / IT Security Office

Hokie™ Confidential



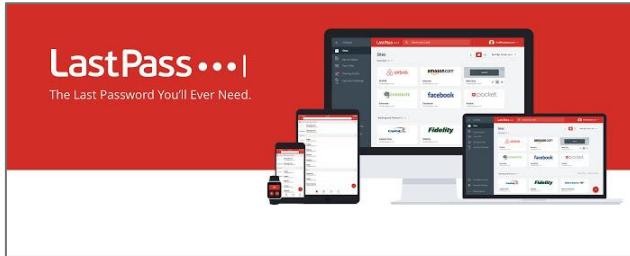
Password Safe

- 28 - passphrase > passwords
- 27
- 26
- 25 - longer is stronger
- 24
- 23 - use four or more words
- 22
- 21 - create a unique password for every account
- 20
- 19
- 18 - consider using a password manager
- 17
- 16
- 15
- 14
- 13
- 12 - see www.it.vt.edu/accounts for details
- 11
- 10
- 9
- 8
- 7



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Password Manager



- **LastPass**

- Cloud-based password storage
- Multi-platform
- Free for one platform - \$36/year for premium account

- **1Password**
 - Similar features as LastPass
 - \$35.88/year



KeePass
Password Safe

- **KeyPass**

- File-based password storage
- Windows/Mac/Linux
- Free (Open Source)



- **Dashlane**

- Similar features as others
- Free for up to 50 passwords - \$59.99 - \$119.88/year for premium
- Highest tier includes identity theft insurance



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Q: What About These?

Dog's name: Nitro

Best friend growing up: Laura Simpson

Birthday: August 15, 1990



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CYBERSECURITY
ALLIANCE

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INITIATIVES

ABOUT US



ONLINE SAFETY BASICS

Stay safe online with our simple top ten tips!

[Learn More >](#)



SCROLL

www.staysafeonline.org



ONLINE SAFETY AND PRIVACY
JUN 20, 2024 | 7 MIN READ

Online Safety Basics

With a little prep, you can shield your information online and secure your digital systems and devices.



ONLINE SAFETY AND PRIVACY
MAY 26, 2024 | 1 MIN READ

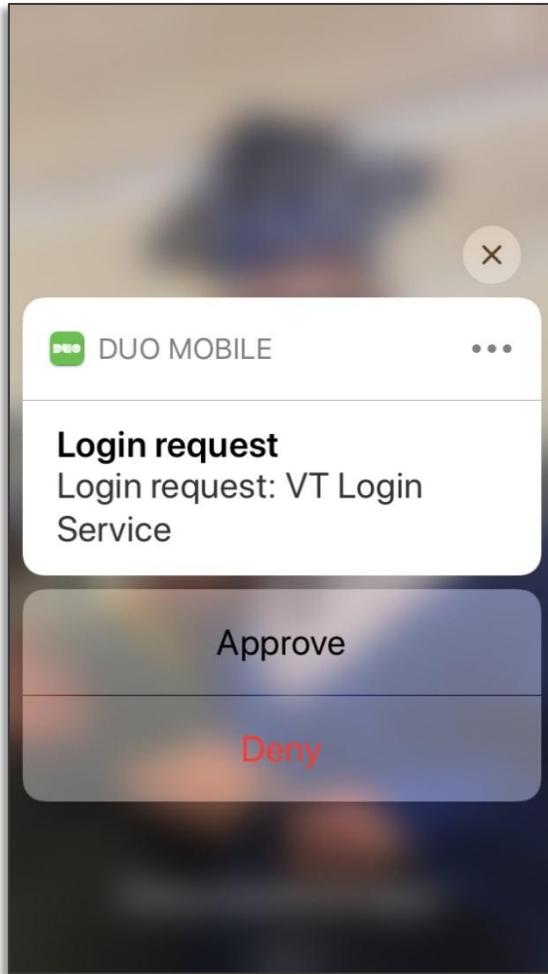
Manage Your Privacy Settings

Direct links to manage your privacy settings on popular platforms and apps.

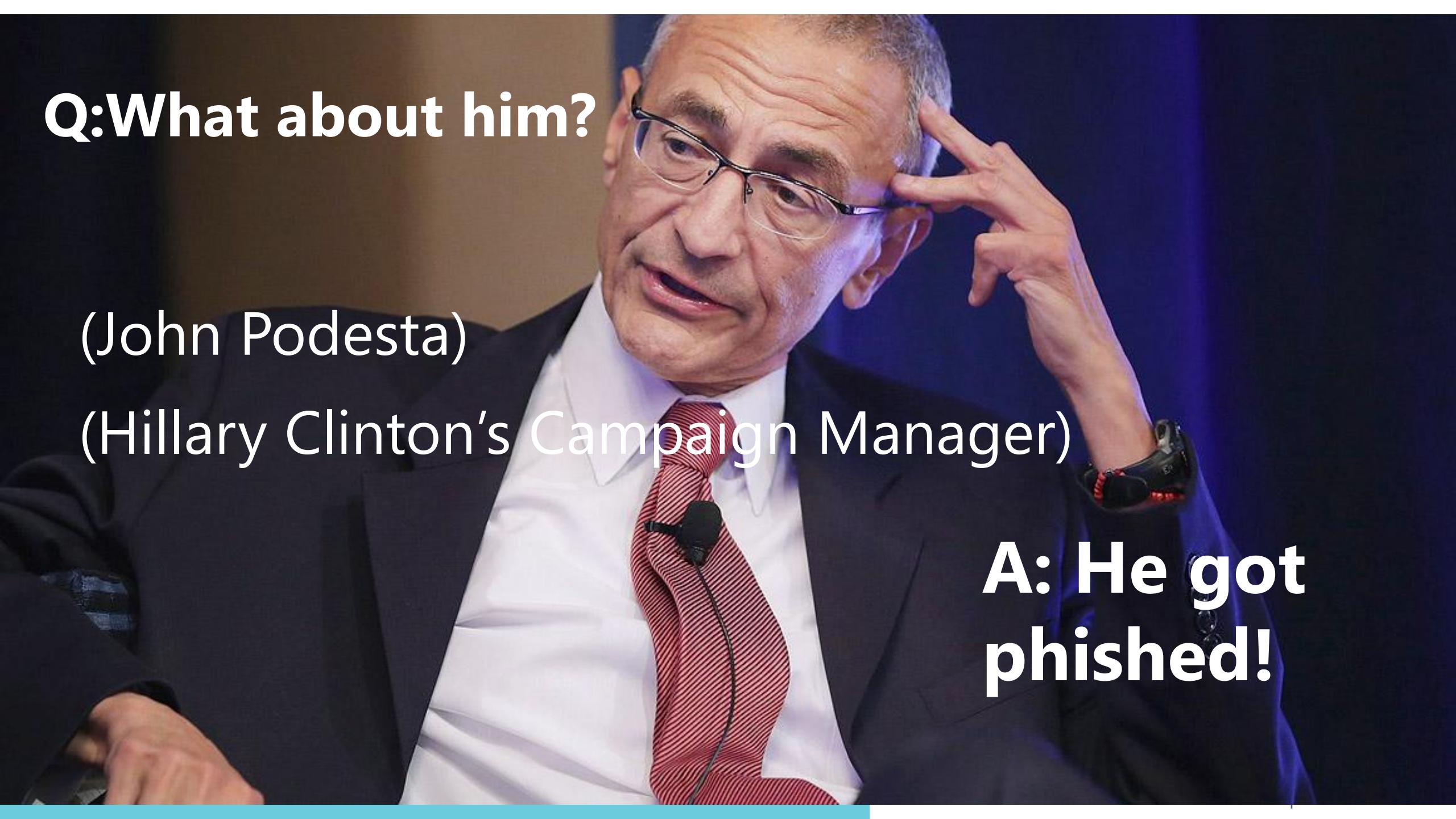


www.staysafeonline.org

Multi-factor Authentication



- Requires a “2nd factor” to gain access to accounts
 - Password is “1st factor”
- Examples 2nd factors
 - Text Message
 - Phone call
 - Authenticator app
- Usually found in account security settings
- Use for “important” accounts
 - Password manager
 - Email accounts
 - Bank/financial
 - Anywhere you have a site saving credit card data



Q:What about him?

(John Podesta)

(Hillary Clinton's Campaign Manager)

**A: He got
phished!**

From: IT-DeskFtYZKiXIBor4aCita42t8FlZDo9ijHUb <noreply@bebasgatal.site>

Sent: Thursday, May 9, 2024 3:46 PM

To: REDACTED@vt.edu

Subject: Reminder: Action Needed -CaseID:UwYjLuRLkbMBqOhTTYKLPAwFF0fQpFW



Helpdesk©

Password System Reminder

The Password for REDACTED@vt.edu is set to expire Today, 9 of May 2024

Continue using same password by clicking the button below to avoid login interruption.

Keep Same Login Access

CONFIDENTIAL COMMUNICATION This transmission is intended only for the individual or entity to which it is addressed and contains information that is confidential. If you have received this communication in error, please delete the email and contact the sender immediately. This information may have been disclosed to you from confidential records and may be protected by federal and state law. This information may include confidential mental health, substance abuse, alcohol abuse and/or HIV-related information. Federal and state law prohibits you from making any further disclosure of this information without the specific written consent of the person to whom it pertains, or as otherwise permitted by law. Any unauthorized further disclosure in violation of the law may result in a fine or jail sentence or both. A general authorization for the release of this information may not be sufficient authorization for further disclosure

 Reply

 Forward



Timothy Sands

EI

EXTREMELY IMPORTANT <carlsonbzcoop@gmail.com>

To: ~~Lana~~, Lana

Lana

It is very important, please reconfirm your cell#.

Thanks.

The physical evidence of the financial transaction HCJ1TFRMVRXL9P#HJ-TA, the bill HCJ1TFRMVRXL9P, serves as a lighthouse of responsibility and transparency, and its attachment signifies the end of the path of trade. The exchange's fine details unfold like a scroll, precisely charting the route from purchase HCJ1TFRMVRXL9P to payment HCJ1TFRMVRXL9P#HJ-TA. Its lines combine descriptions and figures to tell a story of reciprocal duty and economic connection. With its clear representation of the agreement, it becomes a sign of confidence as it becomes attached to the transaction HCJ1TFRMVRXL9P#HJ-TA, bridging the gap between buyer and seller. Its presence causes uncertainty to vanish and is replaced with a sense of closure and affirmation.



DEAR deannakatey@vt.edu,

THANK YOU FOR CHOOSING **NORTON**!

YOUR PAYMENT CARD WILL BE DEBITED AT THE END OF THE DAY FOR THE SUCCESSFULLY RENEWED SUBSCRIPTION TO **NORTON**.

ORDER INFO:

| Security Name | Product Amount | Payment Mode | End | Status |
|---------------|-----------------|-------------------|------------------|---------------|
| NORTON | \$563.53 | Auto Debit | 12 Months | Active |

DATE â€“ 2024-May-08

WITH ONLINE SUPPORT, OUR TECHNICAL SUPPORT TEAM IS READY TO ANSWER QUESTIONS AND GUIDE YOU THROUGH THE REPAIR PROCESS.

IF YOU DID NOT AUTHORISE THIS PAYMENT OR RENEWAL OR IT WASN'T MADE BY YOU, PLEASE CONTACT OUR TECHNICAL SUPPORT TEAM AS SOON AS POSSIBLE TO CANCEL OR REQUEST A REFUND.

+1(830)-(455)-(4719)

Best Regards

David

Oak Lawn Ave, Charlotte, North Carolina 92863

REPLY TO THIS EMAIL IS NOT MONITORED KINDLY CALL SUPPORT DESK.



Order Completed

Dear samitowsifkhan@vt.edu,

Thank you for your purchase!

We are pleased to confirm that your order for a Walmart gift card has been successfully processed. Here are the details of your purchase:

Order Summary:

Gift Card Amount: \$900.00

Recipient's Name: Arslan Khalid

Delivery Method: Email

Order Number: 728965665

Delivery Details: emailed to arslan.khalid@aol.com

Email Delivery: If you selected email delivery, the gift card will be sent to [Recipient's Email Address] within the next 24 hours.

Physical Delivery: If you selected physical delivery, please allow 5-7 business days for the gift card to arrive at [Recipient's Mailing Address]. If you have any questions or need assistance with your order, please do not hesitate to contact our customer service team at [Customer Service Phone Number] or [Customer Service Email Address].

Thank you for choosing Walmart. We hope the recipient enjoys their gift card!

Best regards,

The Walmart Team

1 (830) 297-0286

1 866 562-7022

Hello, order_status1@klaii.online



Here's your invoice

F4 Customs sent you an invoice for \$999.99 USD

Due on receipt.

F4 Customs

 You don't have any payments with this seller in the last year.

Invoice details

Amount requested

\$999.99 USD

Note from seller

Please review the invoice carefully. If there are any issues with your order, contact PayPal customer service at [\(1\(888\)927-6905\)](tel:1(888)927-6905) to cancel the order and request a refund.

Invoice number

000656

[View and Pay Invoice](#)

Don't recognize this invoice?

 [Report this invoice](#)

Before paying, make sure you recognize this invoice. If you don't, report it. [Learn more](#) about common security threats and how to spot them. For example, PayPal would never use an invoice or a money request to ask you for your account credentials.



This invoice isn't available

We removed this invoice because it may have been a scam. Our fraud detection tools work around the clock to help keep online commerce safe for everyone.

What to do next?

Do not call any numbers or click any links that are in the invoice and consider deleting the email.

If you think this invoice is valid, contact the seller for another way to pay.

Powered by  **PayPal**

Copyright © 1999-2025 PayPal. All rights reserved. [PayPal Privacy](#)

VITAL NOTICE! READ ASAP

FN

Frederick Nyantakyi <F.Nyantakyi1215@o365.ncu.edu>

...

Thu 5/16/2024 5:38 AM

WORK FROM HOME FOR \$800 - \$1250 weekly Pay

Urgently needed are remote workers who can handle day to day online purchase of Bitcoin. job requires only your mobile phone and computer.

This is a VT internship Job offer for you and every other students who might be interested.

Pay is \$800 weekly

You work just 2hrs daily, weekends excluded.

To Apply, send your NAME and PHONE NUMBER to our recruiting agent at **NUjobrecruiter@outlook.com**

APPLICANTS MUST BE WILLING TO BEGIN AS SOON AS TODAY!

VITAL VT ALERT

MA

michael abt <michaelabt94@outlook.com>
To: michael abt <michaelabt94@outlook.com>

...

Thu 2/1/2024 10:38 PM

Hello there

We received a request to have your **VT EDU** account terminated and the process has already begun. If this was not authorized by you, please click the link below to undergo a short verification process which automatically puts a stop to the termination process. You are advised to have this done immediately before this account gets terminated.

[**CLICK HERE NOW**](#) to verify and secure your Edu details from been terminated.



VirginiaTech

 Reply

 Forward

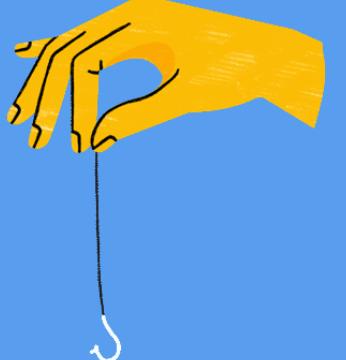
Don't Get Phished

- Don't trust links in emails!
- Hover over links and look for legitimate domains
- Don't open documents that you don't expect
- <https://phishingquiz.withgoogle.com/>

Can you spot when you're being phished?

Identifying phishing can be harder than you think. Phishing is an attempt to trick you into giving up your personal information by pretending to be someone you know. Can you tell what's fake?

[TAKE THE QUIZ](#)



 Jigsaw | Google

Privacy / Terms / Feedback

Safe Browsing

- Provides warnings about sites, downloads, and extensions that have been identified as dangerous
- Available for almost all modern browsers
 - Chrome
 - Firefox
 - Safari
 - Edge
- Most let you choose between *standard* or *enhanced*
- Google “[browser name] safe browsing”

Choose your Safe Browsing protection level in Chrome

When you use Google Safe Browsing in Chrome, you receive warnings that help protect you against malware, abusive sites and extensions, phishing, malicious and intrusive ads, and social engineering attacks.

Safe Browsing crawls and analyzes the web to discover potentially harmful sites and add them to its lists. Each time you visit a website or attempt a download, Chrome checks with Safe Browsing based on the protection level you've selected.

You can choose:

- **Enhanced protection:** Google's most secure browsing experience, Enhanced protection offers security from known and potential new dangers.
- **Standard protection:** By default, Standard protection offers security from known dangers.
- **No protection (not recommended):** You can also turn off Safe Browsing, but you won't be protected against potentially dangerous websites, downloads, and extensions. Your Safe Browsing setting in other Google products won't be affected.

You can choose to visit an unsafe site or download a file after you receive a warning from Chrome.

About Safe Browsing protection levels

[Enhanced protection](#)

[Standard protection](#)





+63 969 507 4754 >

iMessage
Today 6:37 AM

Your package cannot be delivered due to incorrect address information. Please update your address and we will deliver it as soon as possible .

<https://usps.com-trackadlr.top/>

(Please reply Y, then exit the text message, reopen the text message activation link, or copy the link to Safari browser to open it, and get the latest logistics status)

Regards,
The US Postal Team

The sender is not in your contact list.



askwersk-squitterhm6@ez6xf.u4... >



UNITED STATES
POSTAL SERVICE®

from: USPS
Msg: You have a package that needs to be delivered, The package will be returned to the sender soon due to an incorrect delivery address.
To deliver your parcel, update your address now.
eqrco.de/a/RTgtsJ?7385

.Courier#AO8W8MQKB3



USPS_file-63376.
pdf

PDF Document · 118 bytes



Text Message



The Toll Roads Notice of Toll Evasion:
Our records show that your vehicle has been involved in a toll evasion incident. This is a violation of the toll payment regulations and may result in additional penalties, including fines and suspension of access to toll roads.

To avoid further action, Please settle the toll payment within 12 hours. Failure to pay within the specified time will result in increased fines and may be reported to the DMV. We urge you to make the necessary payment promptly to avoid any complications.

<https://txtag.org-txtagstorefrontqqz.xin/us>

VDOT Final Reminder:
You have an outstanding toll. Your toll account balance is outstanding. If you fail to pay by March 6, 2025, you will face penalties or legal action.

Now Payment:

<https://vdot.virginia-ticketee.xin/us>

(Please reply Y, then exit the SMS and open it again to activate the link, or copy the link to your Safari browser and open it)

Please settle your toll immediately after reading this message to avoid penalties for delaying the payment.

Thank you for your cooperation.

11:58

◀ Signal

43

< 1



+1 (424) 402-7410 >

iMessage

Today 11:57 AM

Greetings, dear friend! It's
been so long since we last
connected. Do you
remember me?

The sender is not in your contact list.

[Report Junk](#)



iMessage



2:27

◀ News

49

< 1



+1 (647) 335-9761 >

Text Message • SMS
Today 2:26 PM

Are you still using this
number my friend?

The sender is not in your contact list.

[Report Junk](#)



Text Message • SMS



**NEWS** 13 FEB 2025

Romance Baiting Losses Surge 40% Annually

**Phil Muncaster**

UK / EMEA News Reporter, Infosecurity Magazine

[Email Phil](#) [Follow @philmuncaster](#)

Losses to romance baiting, or pig butchering, scams increased 40% year-on-year (YoY) in 2024 to comprise a third of total crypto fraud revenue, according to Chainalysis.

ADVERTISEMENT







- Premiere Cryptocurrency exchange
 - Handling **70% of all bitcoin transactions** world-wide
- In 2014, **850,000 bitcoins went “missing”**
 - Would be worth **\$81B** in Mar 2025
- Reasons for disappearance? **“Theft, fraud, and mismanagement”***

GONE —

Digital exchange loses \$137 million as founder takes passwords to the grave

QuadrigaCX survivors try to hack encrypted laptop in hopes of accessing cold wallet.

DAN GOODIN - 2/2/2019, 11:40 AM



© Jakub T. Jankiewicz / Flickr

February 2019

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[Home](#) ▶ [Bitcoin Exchange](#) ▶ [QuadrigaCX Wallets Found Empty. Mystery of \\$150 Million Missing Crypto Deepens](#)



Just where is Canadian crypto exchange QuadrigaCX's missing \$150 million in cryptocurrency? |
Source: Shutterstock

QuadrigaCX Wallets Found Empty, Mystery of \$150 Million Missing Crypto Deepens

March 2019



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ANDY GREENBERG

LILY HAY NEWMAN

SECURITY FEB 22, 2025 6:30 AM

Security News This Week: \$1.4 Billion Stolen From ByBit in Biggest Crypto Theft Ever

Plus: Apple turns off end-to-end encrypted iCloud backups in the UK after pressure to install a backdoor, and two spyware apps expose victim data—and the identities of people who installed the apps.

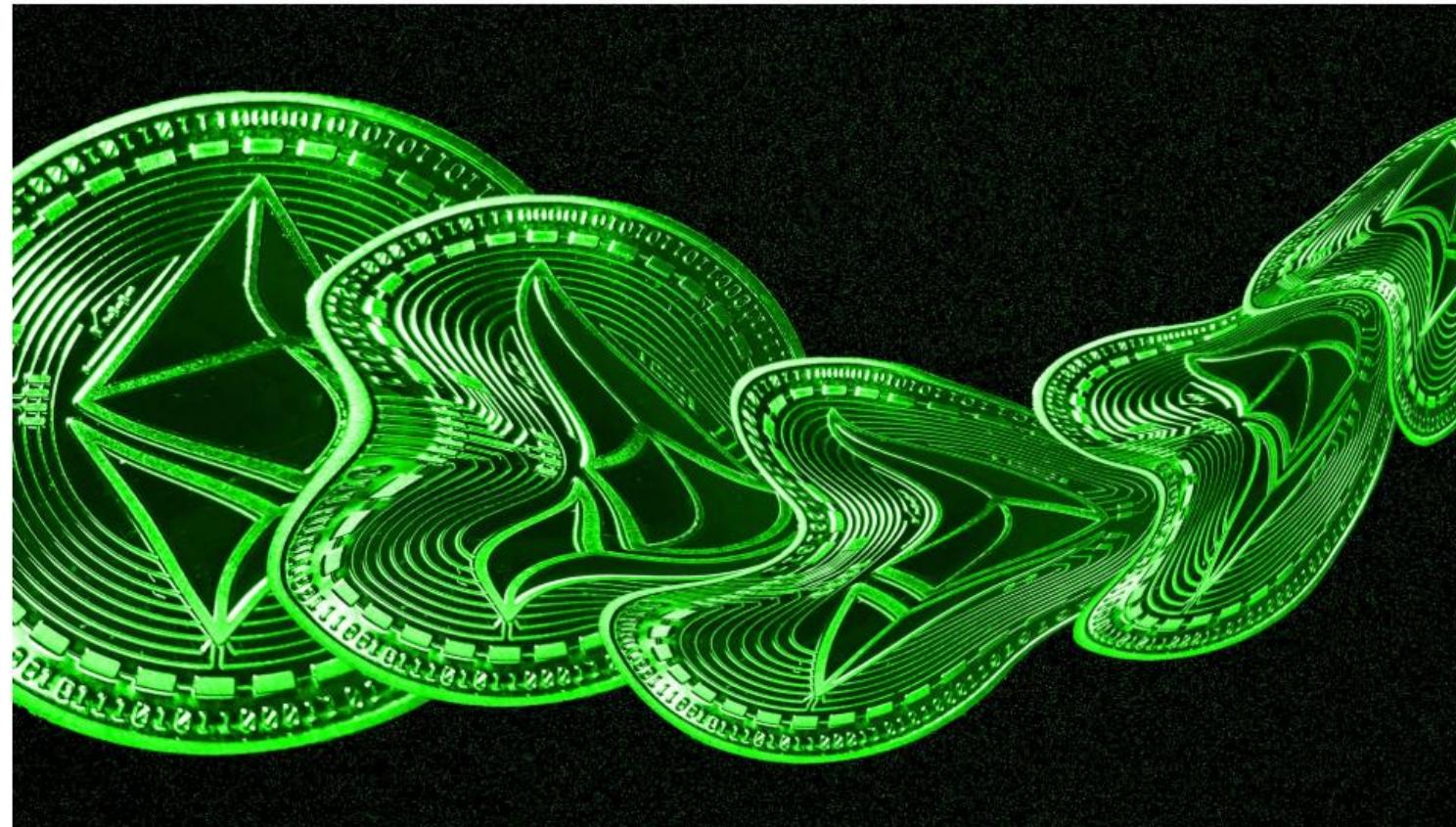


PHOTO-ILLUSTRATION: WIRED STAFF/SHUTTERSTOCK



Pump Notifier/Trading... 15.9K members

share our channel link to your friends
and extend the family!

<https://t.me/PumpNotifier>

Timeanddate

Captain's Pump!!

Countdown to 28 Jun 2017

16:00. Showing days, hours,
minutes and seconds ticking down to 0



5.4K 5:30 /

Pump Notifier/Trading Signals

The big moment is here! 15 mins to go



Will directly put the coin name in 15
mins with direct link to coin page.
(BITTREX)

5.1K 5:45 A

Pump Notifier/Trading Signals

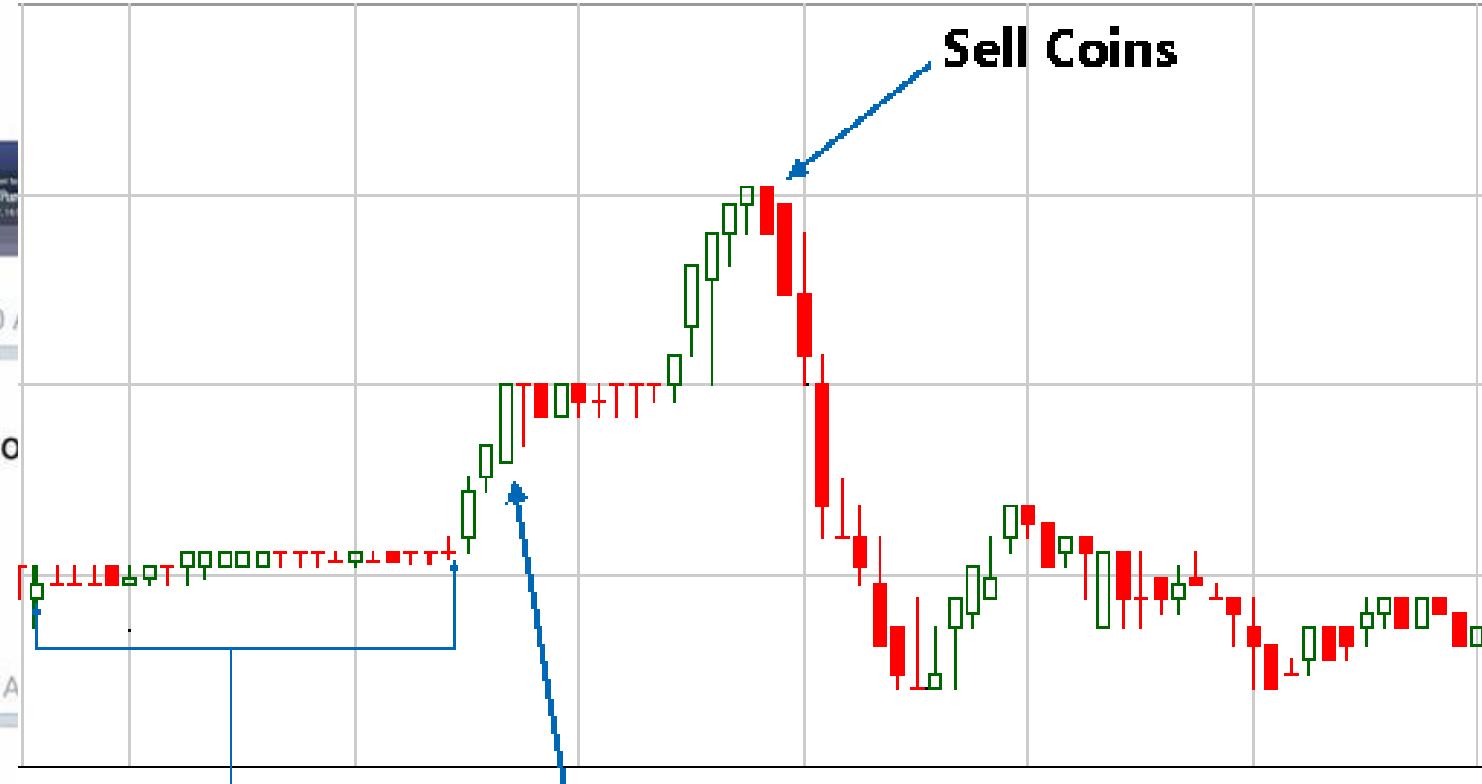
Coin ~ Diamond (DMD)

Excahnge- BITTREX

<https://bittrex.com/Market/Index>

?MarketName=BTC-DMD

4.7K 6:00 AM



Buy Coins

Pump Story



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Statis Group Finds That Nearly 80% of ICOs in 2017 Were Scams



ICO scams: The ICO advisory firm, Statis Group, just [announced](#) its recent study that showed that nearly 80 percent of initial coin offerings (ICOs) held in 2017 were scams.

Questions?



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Making Virginia a
national resource for
cybersecurity education.

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