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## Good News! You Are a Bitcoin Millionaire. Bad News! You Forgot Your Password

Distraught investors go to extreme lengths to recover their lost cryptocurrency, including hypnosis and 'brute force' attacks with a supercomputer



Bitcoin, the largest cryptocurrency by market value, is soaring in price. PHOTO: CHRISTOPHE MORIN/BLOOMBERG NEWS

*By Alison Sider and Stephanie Yang*

Dec. 19, 2017 11:38 a.m. ET

What's worse than missing out on bitcoin's 1,900% rally? Not being able to access your windfall because you forgot your bitcoin password.

Many who bought bitcoin years ago now find themselves sitting on an untouchable bounty. Because they can't remember the complex security codes needed to get to their bitcoins, the coins are in a kind of purgatory. It's like forgetting a bank account password, but there's no bank to call to reset it.

These bitcoin owners have watched in anguish as its price surged over 20-fold at times this year to more than \$19,000. (It traded around \$18,000 Tuesday morning.) Even technology titans have found themselves in the predicament: Elon Musk tweeted last month that he'd misplaced part of a bitcoin.

Philip Neumeier bought 15 bitcoins for around \$260 in 2013, when he was deciding whether to accept the virtual currency on his e-commerce site. Now that his cache is approaching \$300,000 in value, he is hoping to recover a long-forgotten password. He's considered hypnosis, but for now opted to build a supercomputer that tries to use "brute force" to crack the code.

The five foot-tall computer system is working so hard that it sits in a 270 gallon tank in special mineral water to disperse the heat it generates. Still, Mr. Neumeier figures it could take a couple hundred years to run through all the possible combinations of letters, numbers and symbols.

“I should probably be about 332 years old by then—hopefully bitcoin will be worth something,” he says.

A video producer in the San Francisco Bay Area named Nick Testa Jr. let a client pay a \$150 bill in bitcoin in 2014.

Mr. Testa’s fraction of a bitcoin would be worth more than \$2,500 today—if he could get it. He still has his old laptop, but when he opened it, the digital wallet where his bitcoin was stored had been deleted, possibly a victim of overzealous computer housekeeping.

“I really am kicking myself for not taking better care of how I access it,” he says. “Trying to pick it up a year or two or three later it just seems impossible.”

Youssef Sarhan, whose father wiped the old laptop where he kept his password, is live-tweeting his saga. “It’s a slippery slope to going crazy,” Mr. Sarhan says. “It’s like trying to crack open your own brain.”

Transacting in bitcoin requires two keys—one public, and one private. The paired strings of letters and numbers are part of a system that allows bitcoin to change hands without any middlemen. The private key is cumbersome and looks something like this: E9873D79C6D87DC0FB6A5778633389F4453213303DA61F20BD67FC233AA33262. Protecting the private key is paramount—anyone who accesses it can transfer or spend the bitcoin, and transactions can’t be reversed or stopped.



Brian Goss uses two ‘Cryptosteel’ metal boxes to store his password and recovery phrase on stamped tiles. PHOTO: ELIZABETH GOSS

That’s why digital “wallets”—where these keys are stored—have to be heavily guarded, typically with extra passwords. But a lot can go wrong, and layers of security have ensnared many rightful bitcoin owners.

Chainalysis, which tracks the movement of bitcoins in and out of wallets world-wide, estimates that 2.8 to 3.8 million bitcoins are lost—as much as 23% of the total supply. Chainalysis counts the roughly 1 million coins believed to belong to bitcoin’s mysterious founder, who goes by the name Satoshi Nakamoto, among the missing. If true, he, she, or they are now out more than \$18 billion.

Some try to avoid these issues by storing bitcoin with an exchange or another third party that acts as a custodian. But others say such accounts are vulnerable to hacking.

Some people go analog to avoid the possibility of being hacked. Brian Goss, a radiologist in Arizona, stores his keys on a PIN-protected hardware device. He also keeps a 24-word recovery phrase and an extra password in two separate “Cryptosteels”—miniature metal contraptions with stamped tiles, like Scrabble pieces. He keeps one of them several states away to slow down any would-be thieves.

“This might seem a little paranoid, but it’s money,” he says.

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Jason Miller, a hypnotist in Greenville, S.C., recently began offering to help people recall forgotten passwords or find misplaced storage devices. He charges one bitcoin plus 5% of the amount recovered, although he says that’s negotiable.

“I’ve developed a collection of techniques that allow people to access older memories or see things they’ve put away in a stashed spot,” he says.



The CBS sitcom ‘The Big Bang Theory’ mined the humor of lost bitcoins. PHOTO: MICHAEL YARISH/CBS

The quanda ry was feature d on a recent episode of “The Big Bang Theory,” a CBS sitcom. Leonar

d, Raj and Howard, three main characters, go on a wild-goose chase, trying to find thousands of dollars worth of bitcoin they mined seven years ago.

One of the writers on the show had bought bitcoin years ago, to the amusement of the rest of the staff, showrunner Steve Holland says, and “we’ve enjoyed watching and making fun of her emotional roller-coaster” as the value fluctuates.

James Howells, an IT worker in Newport, Wales, lost 7,500 bitcoin he mined in 2009 after a hard drive with his private key was accidentally thrown away during an office cleanup. His story went viral this month as the value of the hard drive’s contents rocketed to more than \$100 million. Now he’s attempting to excavate the landfill and dig through four years’ worth of trash to find it.

For J. Robert Collins Jr., it's all about family togetherness. Mr. Collins, who launched a fund to trade cryptocurrencies this year, gave 16 family members each half of one bitcoin for Christmas four years ago to educate them about the virtual currency. Fourteen have since lost their passkeys.

At this year's gathering, the group plans to look for the access codes together as a family activity. If all are found, it would result in a \$125,000 Christmas bonus, which Mr. Collins says would then probably be entrusted to one responsible person for safekeeping.



James Howells, an IT worker in Newport, Wales, lost 7,500 bitcoin he mined in 2009 after a hard drive with his private key was accidentally thrown away. PHOTO: REX/ZUMA PRESS

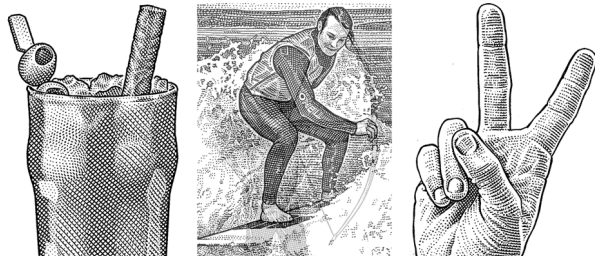
Nathan Murdoch, who had forgotten about the bitcoin he bought three years ago, turned to Dave Bitcoin, a faceless locksmith in the cryptocurrency world. Initially, he harbored doubts over Dave Bitcoin's anonymity and bare-bones website.

"I got to a point where it was take the chance and maybe get lucky, or spend my life and wonder whether I'll ever get it back again," he said.

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Dave Bitcoin is actually four people who run a company called Wallet Recovery Services, which for a 20% cut of the recovered trove try to find a lost key using high powered computers and algorithms. Typically, clients have a vague notion of their password already, and send Dave Bitcoin any

possible words or characters they might have used. The founder, who requested to remain anonymous, said the group is getting four times as many requests as a year ago.

On the day of Mr. Murdoch's birthday, Dave Bitcoin emailed saying that his password had been retrieved.

"Now I've done the paper copies, I've done the back ups," Mr. Murdoch said. "I won't make that same mistake again."

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