

Creating Strong Passwords

What is a weak password?

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123456	qwerty	123123	qwerty123	buster
password	iloveyou	monkey	zxcvbnm	daniel
123456789	princess	654321	121212	hannah
12345678	admin	!@#\$%^&*	bailey	thomas
12345	welcome	charlie	freedom	summer
111111	666666	aaa123456	shadow	george
1234567	abc123	donald	passw0rd	harley
sunshine	football	password1	baseball	222222

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What is a weak password?

- Short
- Dictionary words
- Something with a personal connection to the user
- Common terms (movie titles, sports team names, etc)

What is a weak password?

We often pick passwords that are personally relevant to us, which allow them to be guessed by learning our interests or personal histories (some of which can be found online)

What is a weak password?

People are fairly predictable when it comes to choosing passwords

What is a weak password?

We have a tendency to make predictable variations of the same password

What is a weak password?

We have a tendency to make predictable variations of the same password

MyDogIsAwesome

What is a weak password?

We have a tendency to make predictable variations of the same password

MyDogIsAwesome1

What is a weak password?

We have a tendency to make predictable variations of the same password

MyDogIs@wesome1

What is a weak password?

We have a tendency to make predictable variations of the same password

MyDogIs@weSome1

What is a weak password?

We tend to use the same or similar passwords
across multiple sites

What is a weak password?

The shorter the password, the easier it is for a computer to guess it



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';---have i been pwned?

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

pwned?

What is a strong password?

What is a strong password?

Long

What is a strong password?

Long

Unique

What is a strong password?

Long

Unique

Random

What is a strong password?

Long

At least 16 characters

Contains numbers, symbols, upper, lower, spaces

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Contains numbers, symbols, upper, lower, spaces

#MyDogIsAwesome#

What is a strong password?

Long

At least 16 characters

Contains numbers, symbols, upper, lower, spaces

#MyD0g1sAwes0me#

What is a strong password?

Long

At least 16 characters

Contains numbers, symbols, upper, lower, spaces

#MyD 0g1 sAwe s0me#

What is a strong password?

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#MyD 0g1 sAwe s0me#

What is a strong password?

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(16 Thousand Years to Guess)

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What is a strong password?

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(16 Thousand Years to Guess)

#MyD 0g1 sAwe s0me#

(36 Quintillion Years to Guess)

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#MyD 0g1 sAwe s0me#

(36 Quintillion Years to Guess)

(According to howsecureismypassword.net)

What is a strong password?

Unique

- Free of repetition and pre-defined sequences
- Unique PW for *every* service that you use
 - If you reuse passwords and one gets hacked, all of them get hacked!

What is a strong password?

Unique

Password managers

LastPass

1Password

Dashlane

What is a strong password?

Unique

Password managers

- Creates a random, secure password for each account you have
- Passwords are accessed via one password you create

What is a strong password?

Unique

Password managers

- Still need to remember 1 main PW
- Breaches can happen!

What is a strong password?

Unique

LastPass:

- free to use
- Firefox/Chrome extensions
- mobile version = \$1 per month

What is a strong password?

Unique

Alternative is writing unique passwords down on paper, which some security experts recommend

Secure, unless:

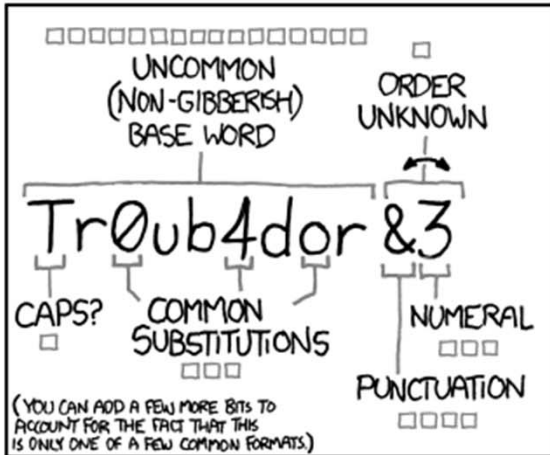
1. Someone finds the paper/notebook
2. You lose it

What is a strong password?

Passwords vs. Passphrases

What is a strong password?

Passwords vs. Passphrases



~28 BITS OF ENTROPY

2²⁸ = 3 DAYS AT 1000 GUESSES/SEC

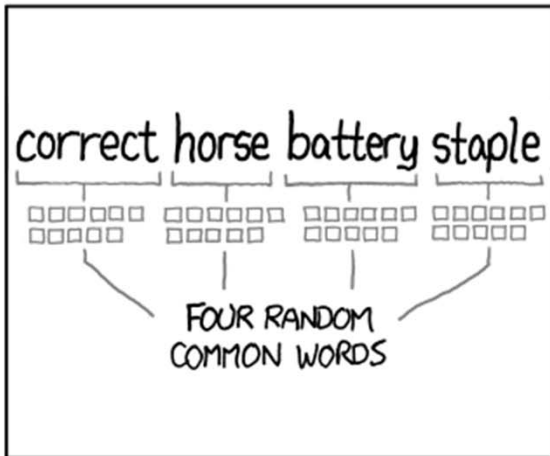
(PLAUSIBLE ATTACK ON A WEAK REMOTE WEB SERVICE. YES, CRACKING A STOLEN HASH IS FASTER, BUT IT'S NOT WHAT THE AVERAGE USER SHOULD WORRY ABOUT.)

DIFFICULTY TO GUESS: **EASY**

WAS IT TROMBONE? NO, TROUBADOR. AND ONE OF THE 0s WAS A ZERO?

AND THERE WAS SOME SYMBOL...

DIFFICULTY TO REMEMBER: **HARD**



~44 BITS OF ENTROPY

2⁴⁴ = 550 YEARS AT 1000 GUESSES/SEC

DIFFICULTY TO GUESS: **HARD**

THAT'S A BATTERY STAPLE.

CORRECT!

DIFFICULTY TO REMEMBER: YOU'VE ALREADY MEMORIZED IT

THROUGH 20 YEARS OF EFFORT, WE'VE SUCCESSFULLY TRAINED EVERYONE TO USE PASSWORDS THAT ARE HARD FOR HUMANS TO REMEMBER, BUT EASY FOR COMPUTERS TO GUESS.

xkcd.com
/936/

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Random

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Humans are generally bad at creating random passwords, as our minds like to work in patterns

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Creating random passwords/phrases can be done best when external sources are used, such as random words in a book

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Technique 1: Randomly select 5-6 words from a book to create a passphrase

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Technique 2: Diceware Password Creation

Example: <https://www.rempe.us/diceware/#eff>

What is a strong password?

Random

Memorize this random passphrase and then use it as your main password in your password manager.

Best Practices

Level 1:

Use different passwords for all services

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Level 2:

Use a password manager to create random passwords

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Level 1:

Use different passwords for all services

Level 2:

Use a password manager to create random passwords

Level 3:

Secure your password manager with a randomly created passphrase of 5-6 words

Sources

<https://sec.eff.org/topics/passwords>

<https://www.cnet.com/how-to/the-guide-to-password-security-and-why-you-should-care/>

<https://www.cnet.com/how-to/how-to-master-the-art-of-passwords/>

https://motherboard.vice.com/en_us/article/d3devm/motherboard-guide-to-not-getting-hacked-online-safety-guide

<https://theintercept.com/2015/03/26/passphrases-can-memorize-attackers-cant-guess/>