Multi-Factor Authentication

And its common misconception.

About

Tijme Gommers

- Product Lead / Red Teamer / Developer
- Works at Northwave Security
- Lives in the Netherlands
- Author of open-source software
  Kernel Mii, Raivo OTP, WikiRaider
- Socials username is @tijme
  Twitter, GitHub, LinkedIn

Our corporate accounts can't be hacked, we use strong passwords *and MFA*.

- Chief Information Security Officer -

Multi-Factor Authentication (MFA)

It comes in many factors, according to Microsoft categorized as below.

Bad	Good	Better	Best
password	*password and …*	*password and …*	*paswordless*
• 123456 • Welcome01 • Summer2022! • Winter2022! • September2022! • Coffee02	SMS 	Raivo  Push 	Certificates   Biometrics 

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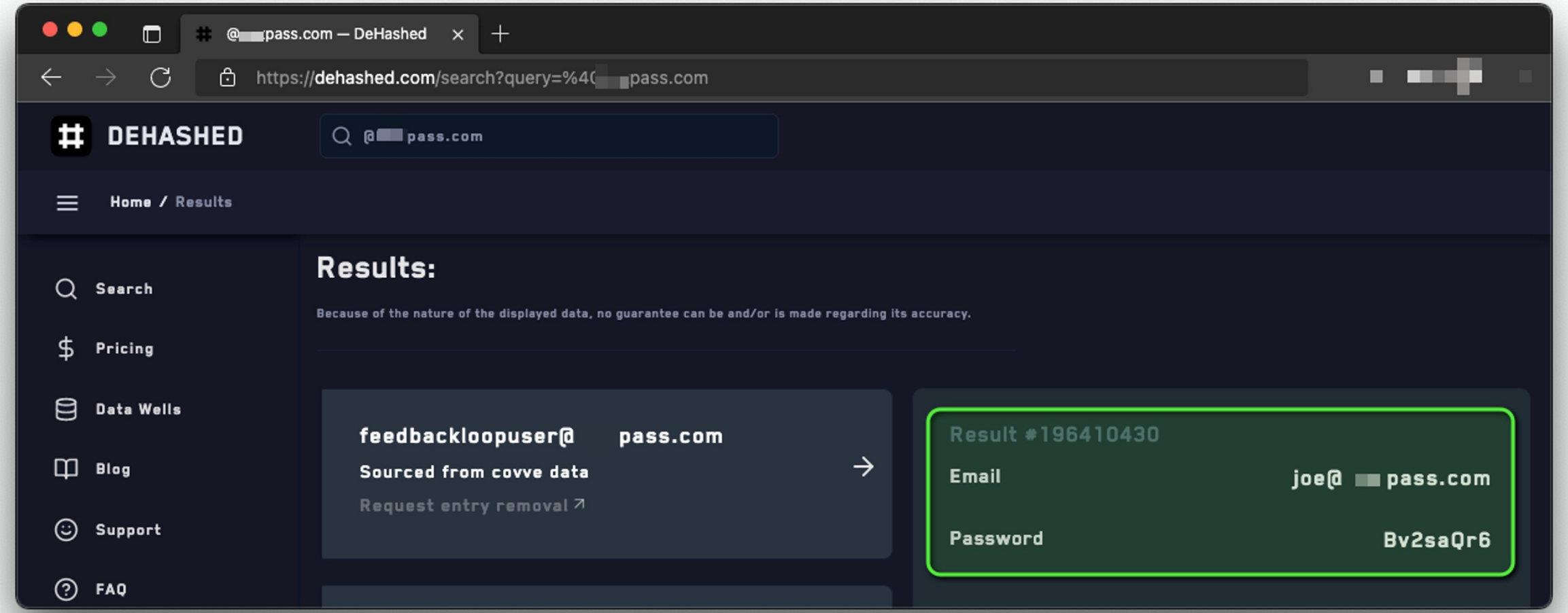
Password without MFA

Vulnerable to data breaches.



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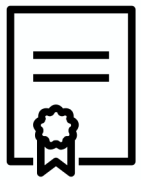
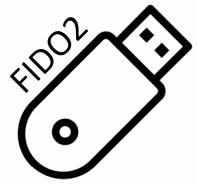
SMS

Raivo

Push

Certificates

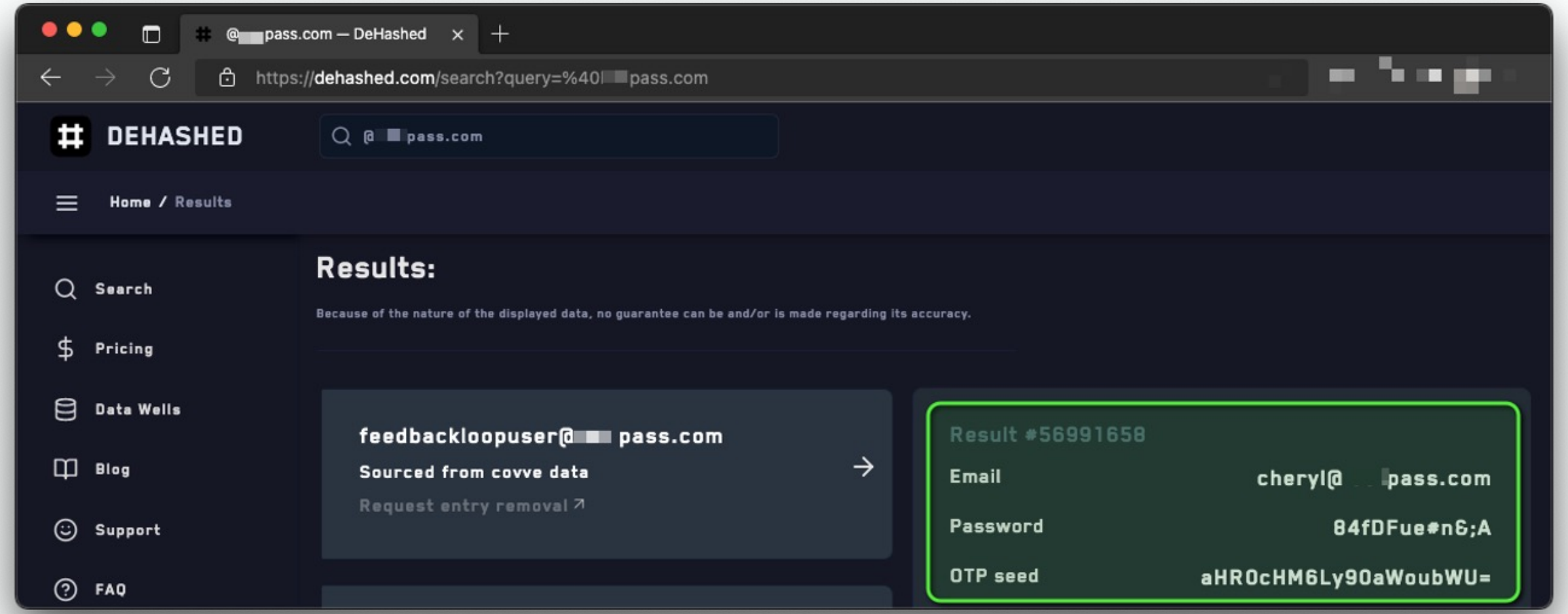




Biometrics

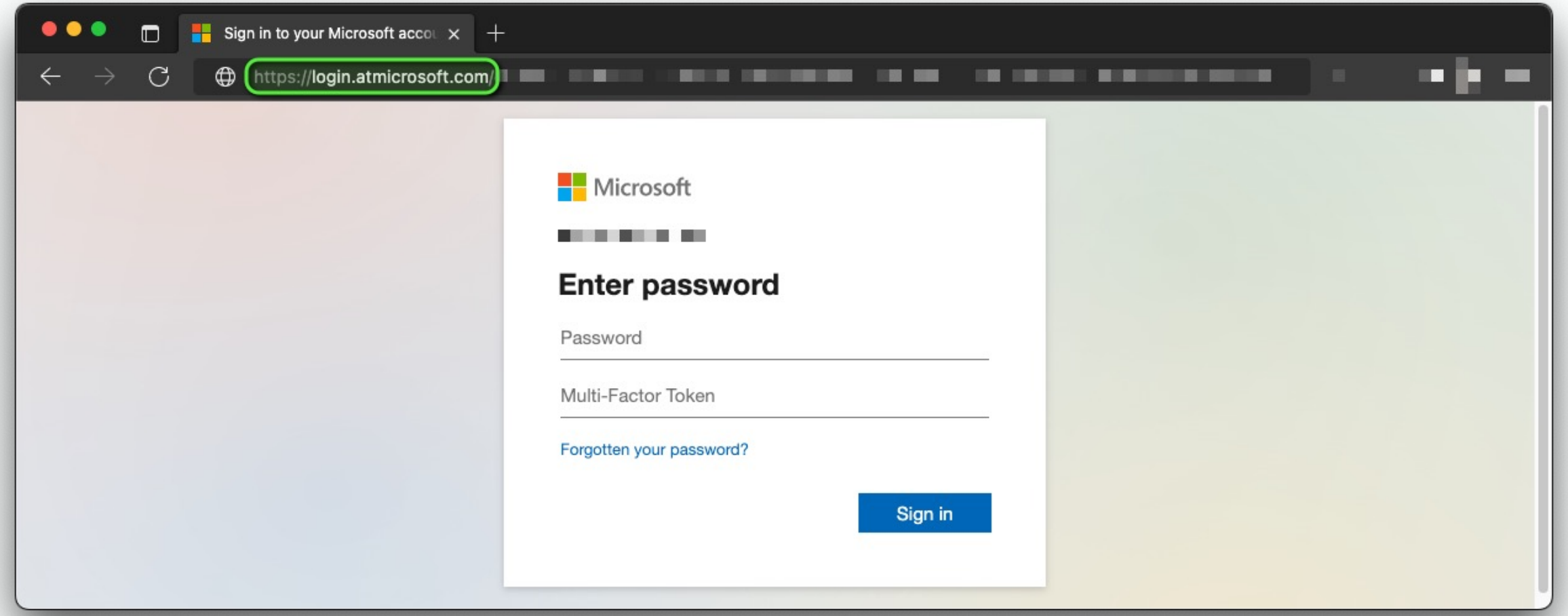
Password with SMS MFA

Vulnerable to data breaches.



Password with SMS MFA

Vulnerable to password & token phishing.



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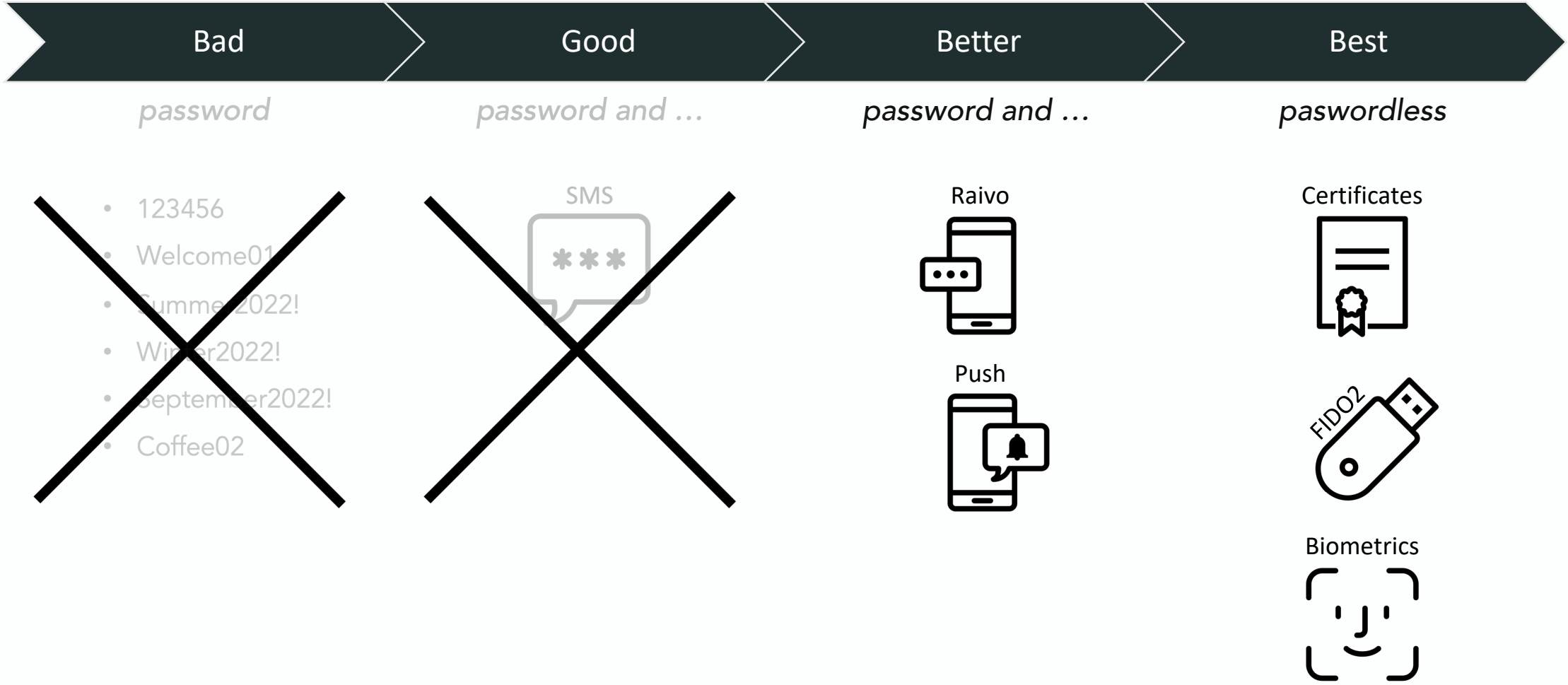


Password with push MFA

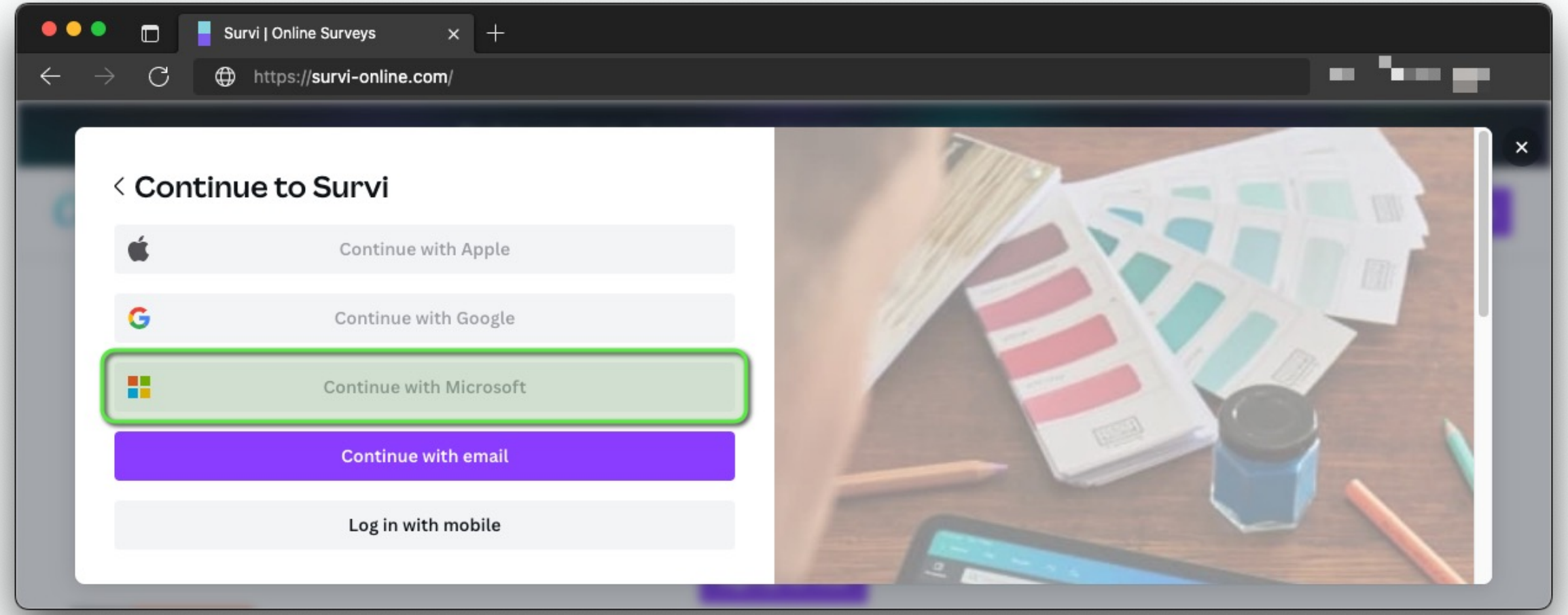
Vulnerable to password spraying.


```
$ spray365.py spray -ep plans/password.plan --lockout 2

[2022-05-09 13:25:11 - INFO]: Processing execution plan 'plans/pass
[2022-05-09 13:25:11 - INFO]: Identified 521  credentials in the provided execution p
[2022-05-09 13:25:11 - INFO]: Password spraying will take at least 31790 seconds
[2022-05-09 13:25:11 - INFO]: Lockout threshold is set to 2 accounts
[2022-05-09 13:25:11 - INFO]: Starting to spray credentials
[2022-05-09 13:25:12 - SPRAY 001/521]: b.jong / January2022! (Failed: Invalid credentials)
[2022-05-09 13:25:17 - SPRAY 002/521]: a.wijkerd / January2022! (Failed: Invalid credentials)
[2022-05-09 13:25:23 - SPRAY 003/521]: a.moos / January2022! (Failed: Invalid credentials)
[2022-05-09 13:25:28 - SPRAY 004/521]: a.baan / January2022! (Failed: Invalid credentials)
[2022-05-09 13:25:33 - SPRAY 005/521]: a.rovert / January2022! (Success: Valid credentials)
[2022-05-09 13:25:39 - SPRAY 006/521]: a.gaanders / January2022! (Failed: Invalid credentials)
[2022-05-09 13:25:44 - SPRAY 007/521]: a.bol / January2022! (Failed: Invalid credentials)
[2022-05-09 13:25:49 - SPRAY 008/521]: aa.romoes / January2022! (Failed: Invalid credentials)
[2022-05-09 13:25:55 - SPRAY 009/521]: ab.timons / January2022! (Partial Success: Account locked)
[2022-05-09 13:26:00 - SPRAY 010/521]: b.kuijpers / January2022! (Failed: Invalid credentials)
[2022-05-09 13:26:05 - SPRAY 011/521]: ac.langestraat / January2022! (Failed: Invalid credentials)
```

Password with push MFA

Vulnerable to (BITB) proxy phishing.



Password with push MFA

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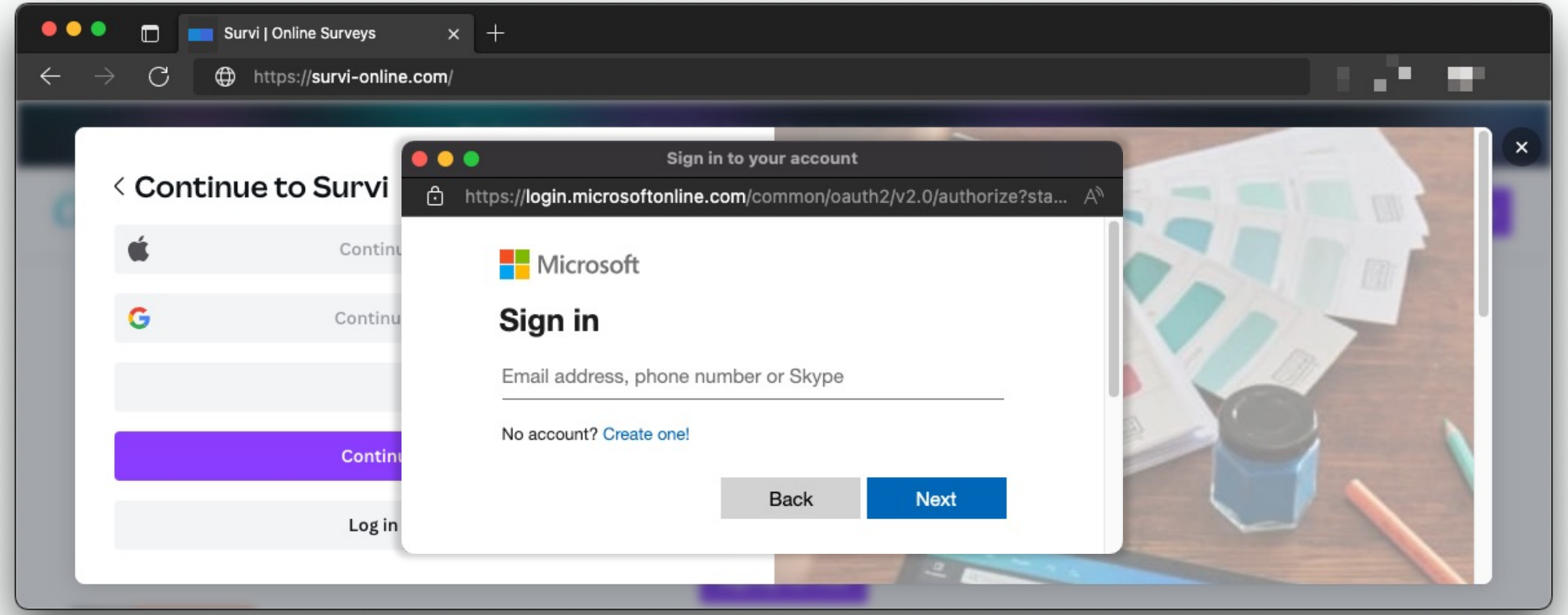

Password with push MFA

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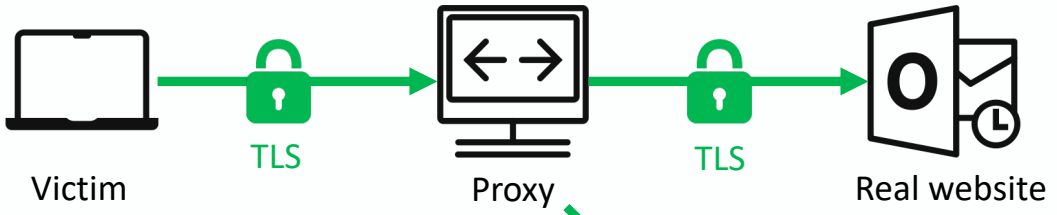
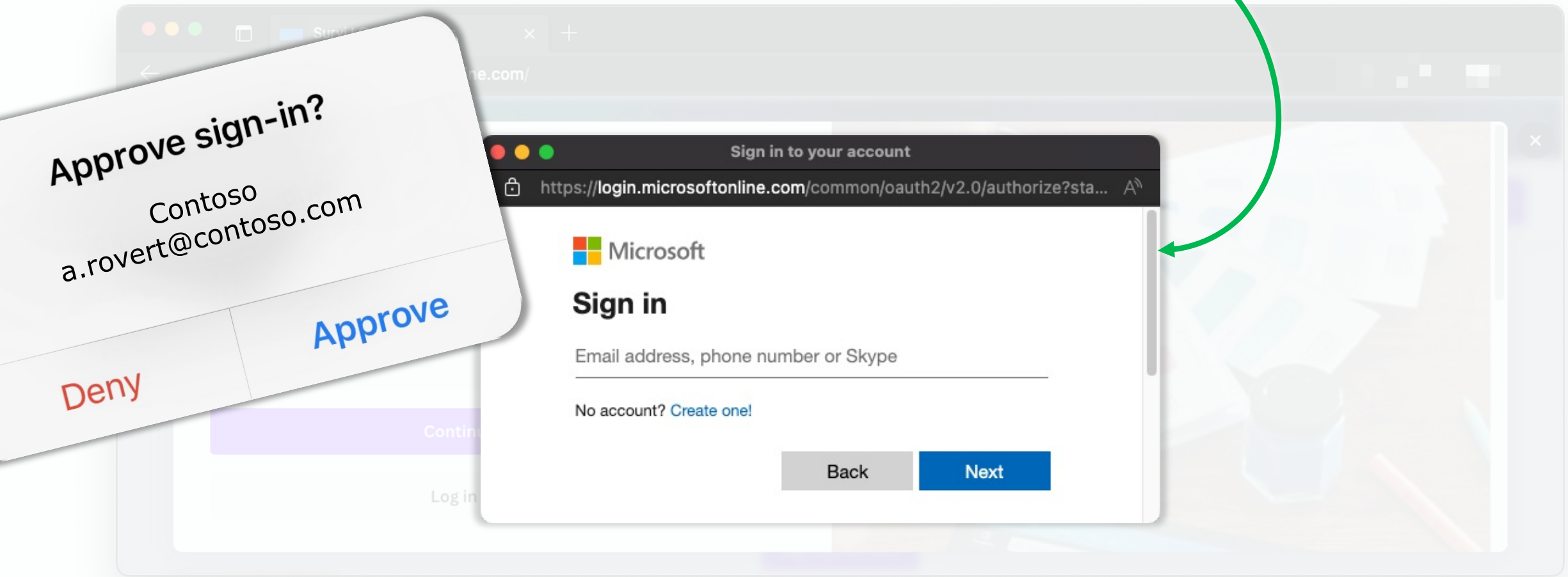




Passwordless MFA

It comes in many factors.

Bad → Good → Better → Best

password | *password and …* | *password and …* | *paswordless*

- 123456
- Welcome01
- Summer2022!
- Winter2022!
- September2022!
- Coffee02

SMS

Push

Certificates

FIDO2

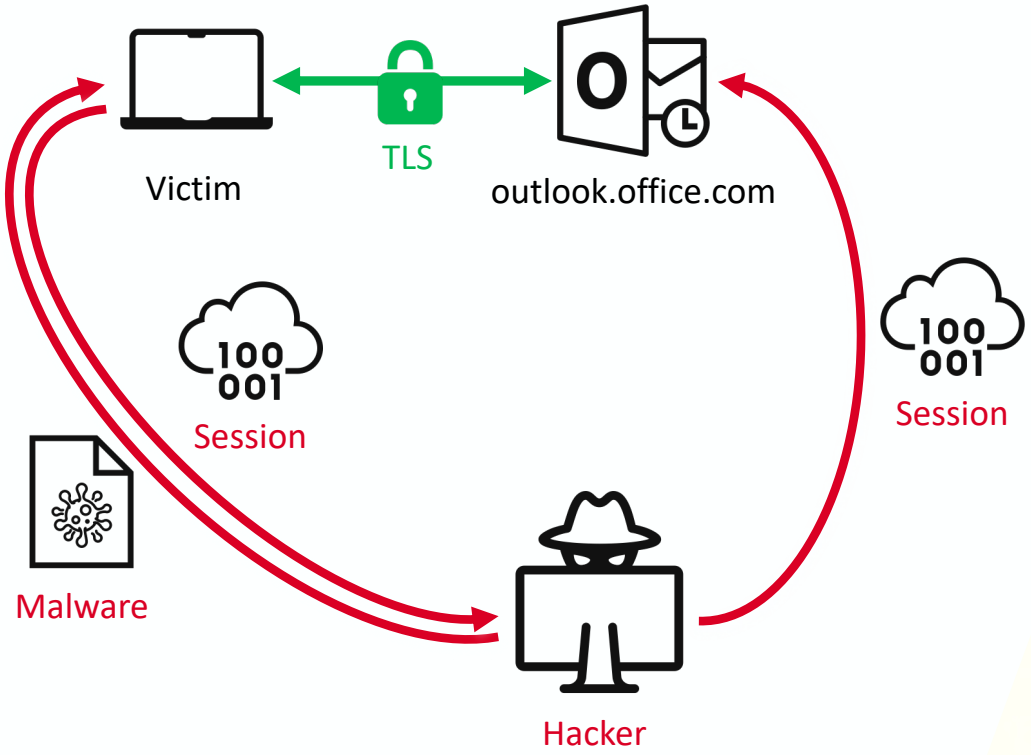
Biometrics

So, if we go passwordless our corporate accounts can’t be abused?

- Chief Information Security Officer -

Passwordless

Let’s put it to the test!



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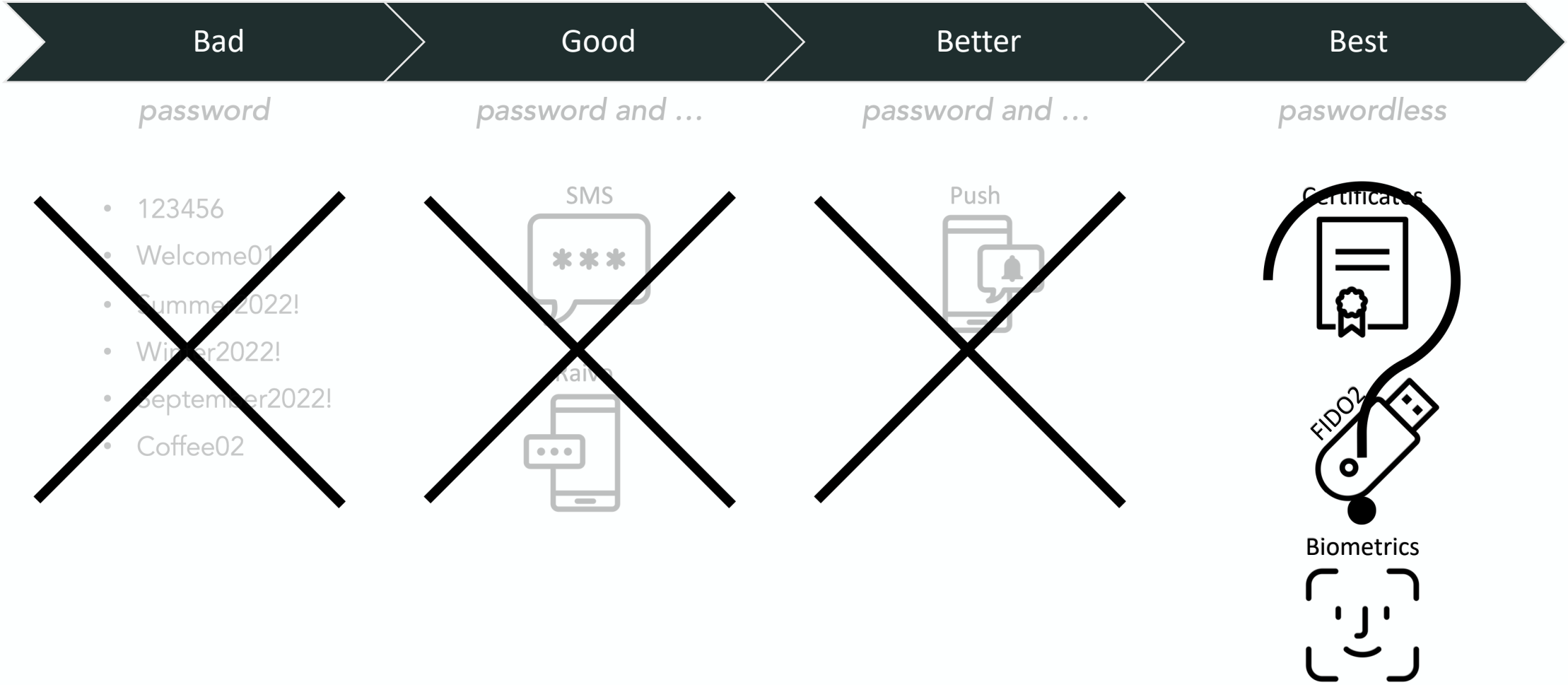

Passwordless authentication is not the holy grail, but it's the best we have!

- Chief Information Security Officer -


Multi-Factor
Authentication
And its common misconception.
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