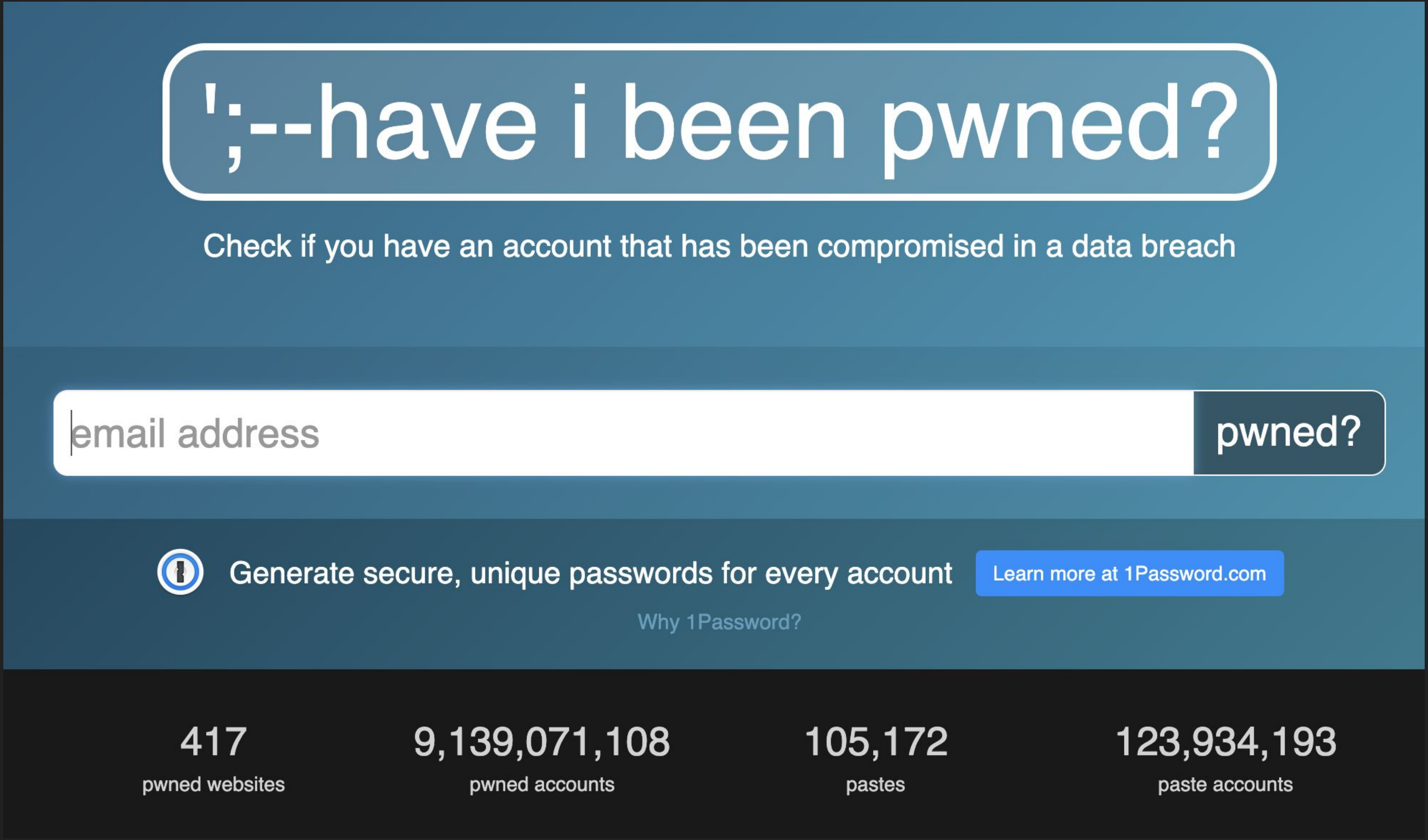
WebAuthn 101

Ståle Pettersen, 11.12.2019

Me

- Dev and security guy for 15+ years
- Head of Product & Application Security in Schibsted (FINN, VG, Prisjakt, Lendo, etc.)
- Poker, Snowboard, Lock-picking, Security stuff
- OWASP Norway Board member
- We are hiring Security Engineers! (bit.ly/sch-appsec)



';--have i been pwned?

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

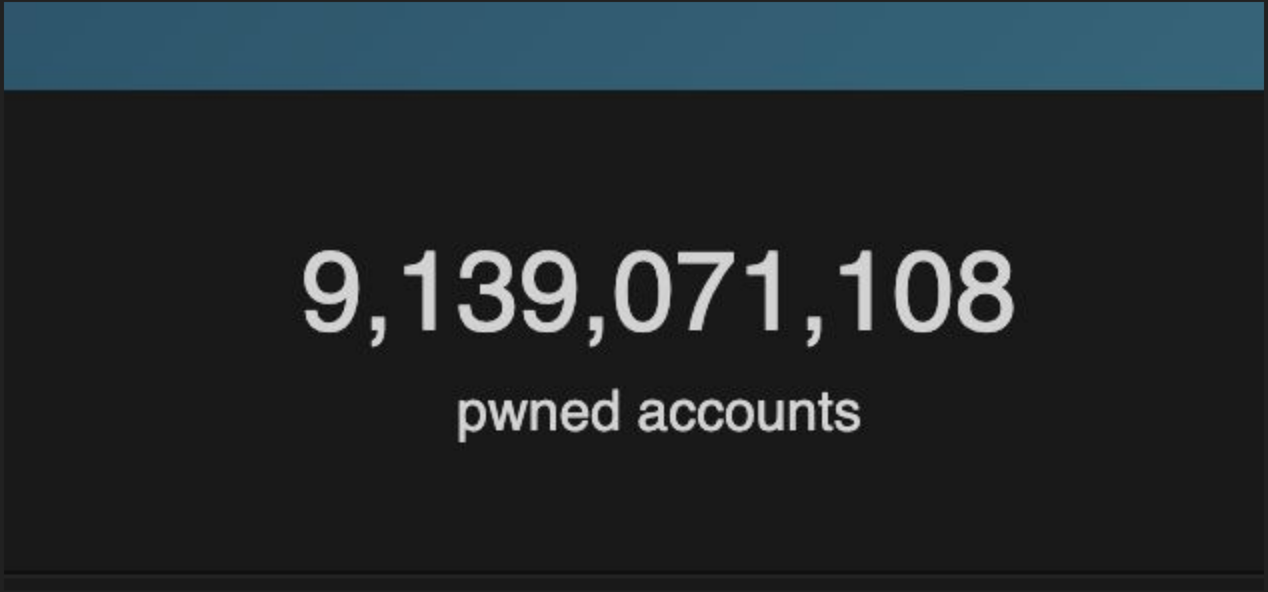
Generate secure, unique passwords for every account

417
pwned websites

9,139,071,108
pwned accounts

105,172
pastes

123,934,193
paste accounts



9,139,071,108

pwned accounts

Solution: Password manager

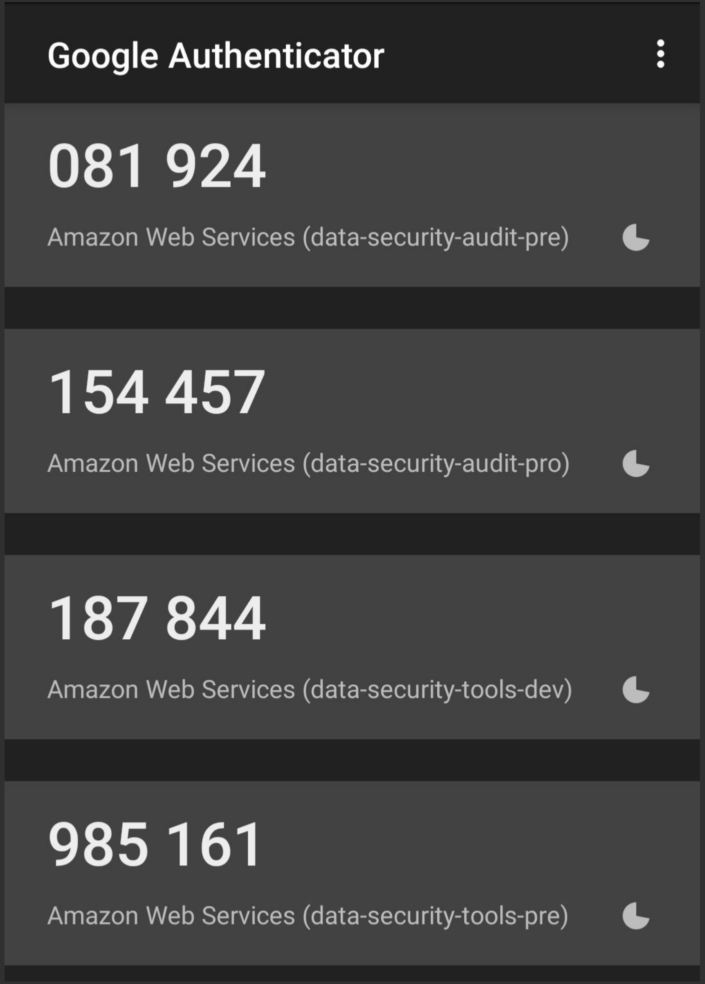
Solution: password manager

NO!

Solution: Password manager

YES, but...

Already have 2FA!
SMS/TOTP/HOTP



Google Authenticator

081 924

Amazon Web Services (data-security-audit-pre)

154 457

Amazon Web Services (data-security-audit-pro)

187 844

Amazon Web Services (data-security-tools-dev)

985 161

Amazon Web Services (data-security-tools-pre)

WebAuthn

=

Web Authentication API

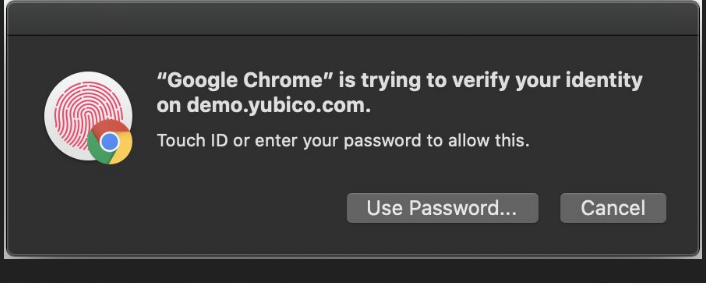
Standardized JS interface for authenticating users to web-based applications and services using public-key cryptography.

Published by W3C in March 2019

Authenticator types

- Platform authenticator
  - OS backed (stored in TPM, Secure Enclave or similar).
  - Examples: Windows Hello, Android, macOS

- Roaming authenticator
  - Hardware tokens
  - Supported: USB, NFC or BT
  - Examples: Yubico 5, Titan Security Key



"Google Chrome" is trying to verify your identity on demo.yubico.com.

Touch ID or enter your password to allow this.

WebAuthn support

- Chrome
- Firefox
- Edge
- Safari (macOS and iOS)

- Windows & Windows Hello & AD etc
- Android
- ChromeOS

WebAuthn supports:

- Registration authenticatorMakeCredential()
- Login authenticatorGetAssertion()

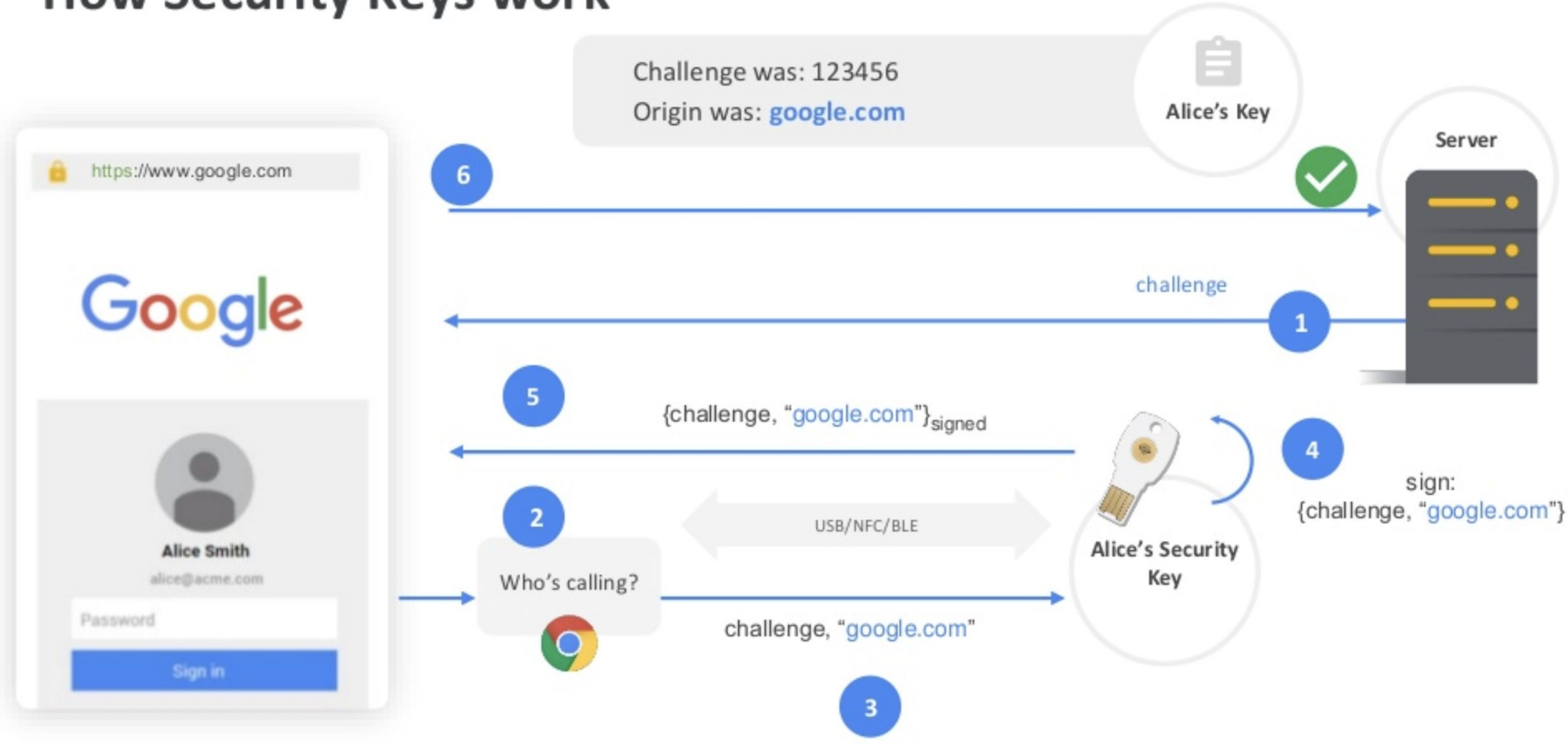
WebAuthn privacy:

- No global identifier

WebAuthn Demo

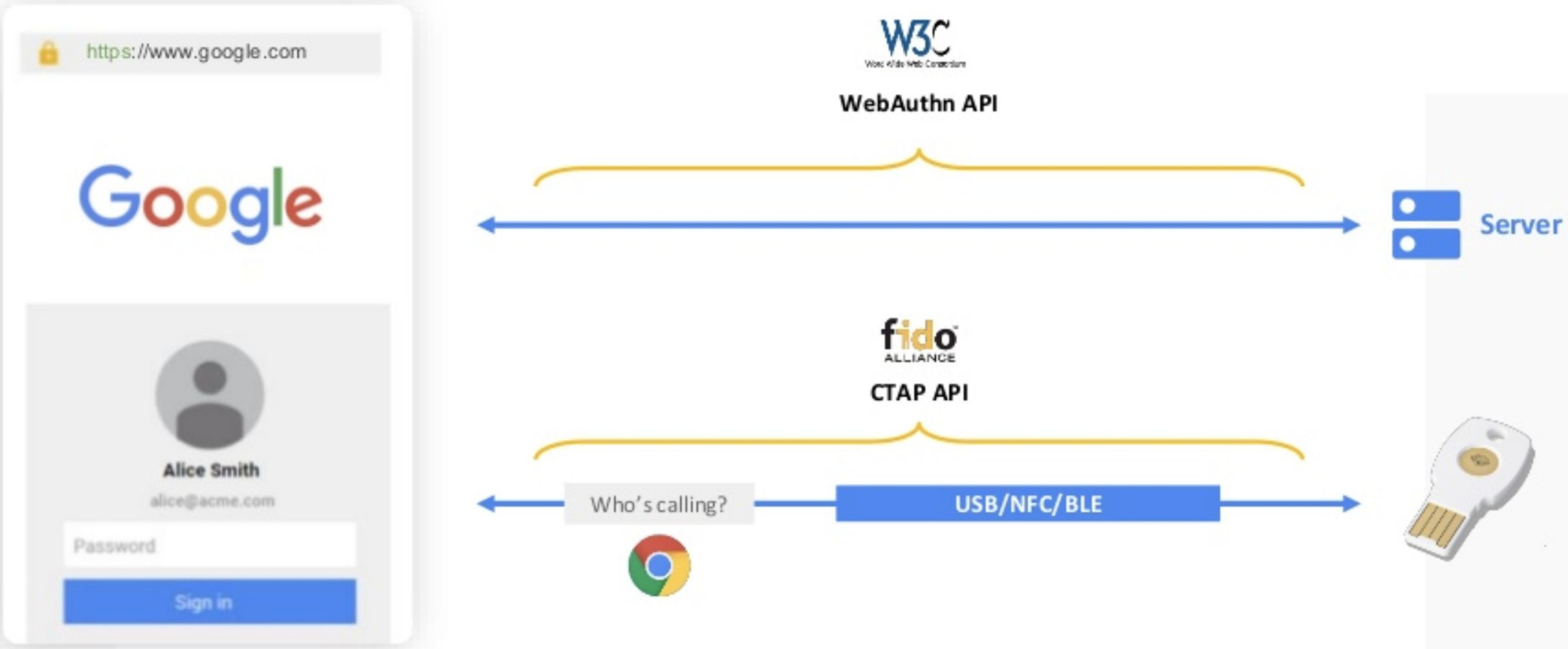
Look! No password

How Security Keys work



https://www.slideshare.net/FIDOAlliance/webauthn-and-security-keys-126400301

Created with open standards



https://www.slideshare.net/FIDOAlliance/webauthn-and-security-keys-126400301

FIDO2 and WebAuthn

FIDO2 = **WebAuthn** (client API) + **CTAP1&2** (authenticator API)

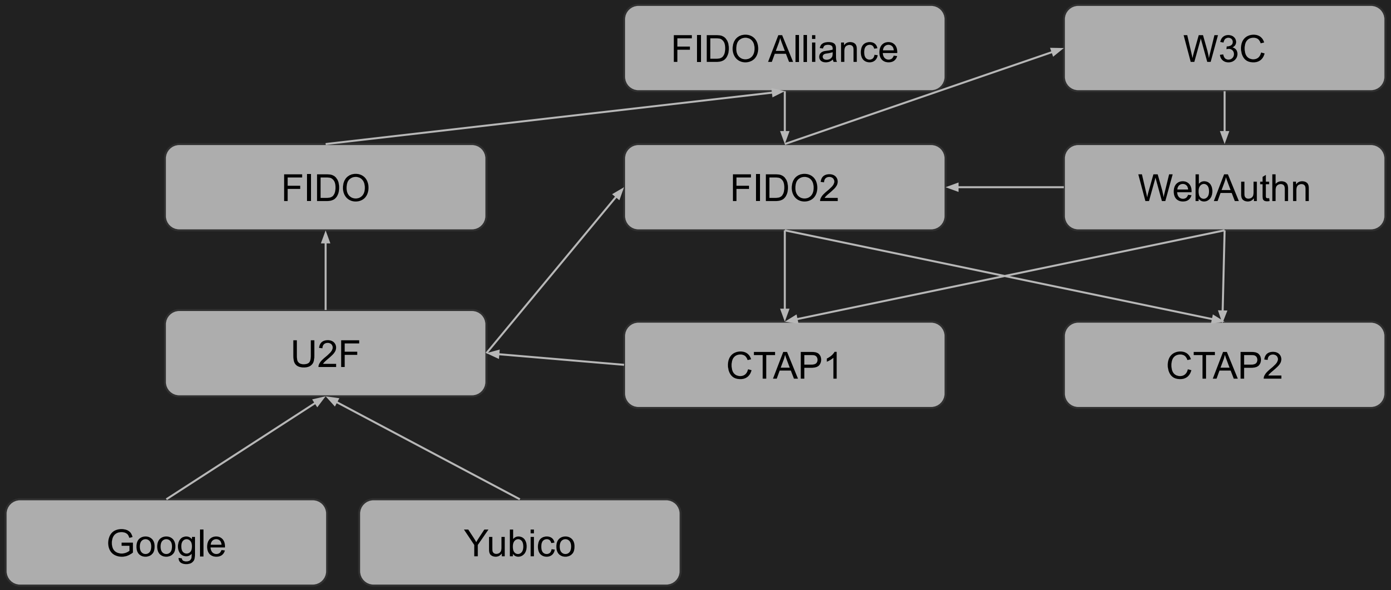
U2F vs FIDO2

U2F = **WebAuthn** (client API) + “**CTAP1**” (authenticator API)

U2F: Can only be used as second factor, no passwordless login etc.

Created by Google and Yubico, donated to FIDO Alliance as “FIDO 1”.

WebAuthn history



WebAuthn/FIDO2

- Single factor authentication

  Credential management API Support Public key crypto

- 2nd Factor Authentication

  WebAuthn (supports CTAP1 and CTAP2)

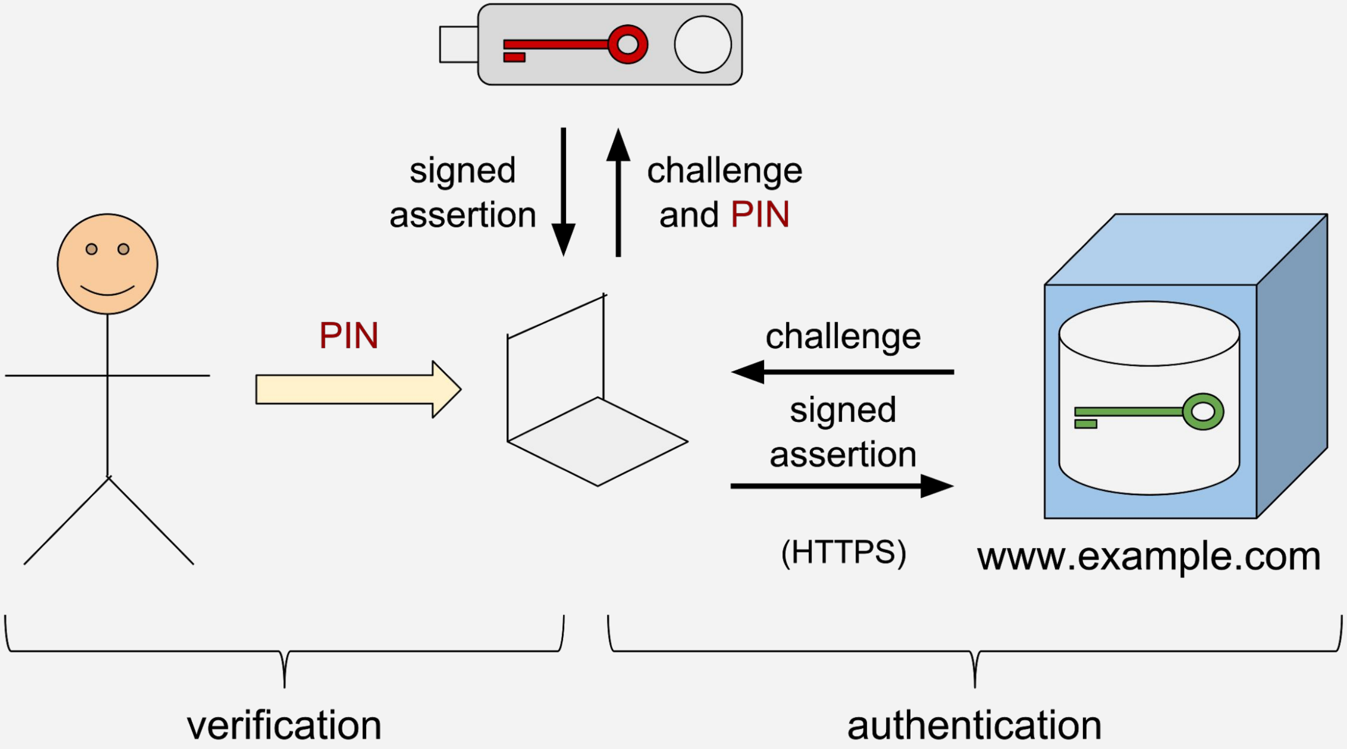
- Multi-Factor: Passwordless + PIN/Bio

  CTAP2 Support User Info Verification

Yubikey Bio

YubiKey Bio
coming soon!

Second factor



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FIDO2: 2FA auth everywhere

- Web
- Windows Hello
- ChromeOS
- Active Directory
- Even SSH

Recovery

- Register multiple keys on all accounts (minimum 2)
  - But...They both need to be in your possession when registering them, risky state!

- DRAFT: WebAuthn recovery credentials extension (6.Nov, 2019)

U2F/FIDO1 vulnerabilities

Google Titan Security Key - bluetooth pairing issue

Phish Yubikey Neo with Chrome WebUSB weakness

ChromeOS U2F ECDSA vulnerability (64 bits instead of 256 bits)

Questions?

Guide and resources: https://webauthn.guide/

Great Developer guide: https://codelabs.developers.google.com/codelabs/webauthn-reauth/

Yubico WebAuthn Demo: https://demo.yubico.com/webauthn

WebAuthn Demo: https://webauthn.io/