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Macs Factor:
The Risks and Rewards of Single Sign On

Sean Rabbitt

Sr Consulting Engineer,
Identity and Access Mgmt

PRESENTING TO

2024 MACADMINS CONFERENCE

Agenda

1 | Authentication Factors and Other Confusion

Passwords, and tokens, and biometrics, oh my!

2 | What the heck is "Single Sign On"?

There's only two identity providers in the world that support this thing, so I could understand your confusion.

3 | Hardening with factors and rules

Okta calls it one thing, and Microsoft calls it another thing. And now as an Apple admin, it's your thing.

4 | And then there's Platform Single Sign-On...

In which we supply a slide with the words "Don't Panic" in large friendly characters. Cake to follow.

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“If you wish to make an apple pie from scratch, you must first invent the universe.”

Carl Sagan

COSMOS, C. 1980

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Authentication Factors or why don't you trust me

And what exactly do identity people have against jam bands from the 90's anyway?

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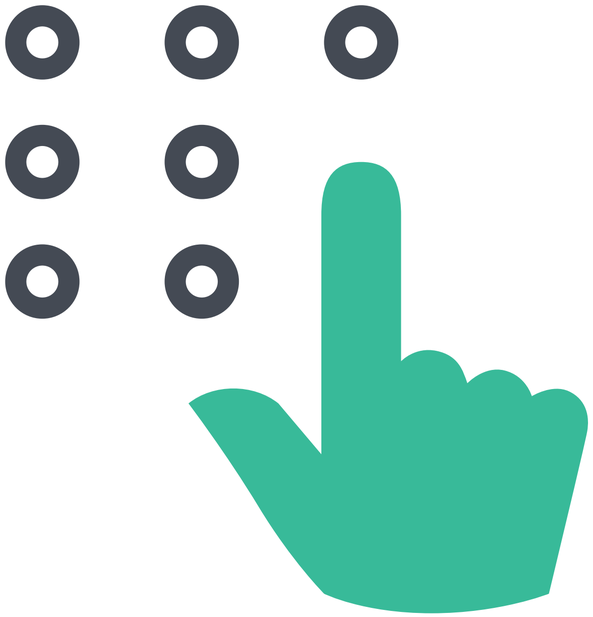
Factor Types



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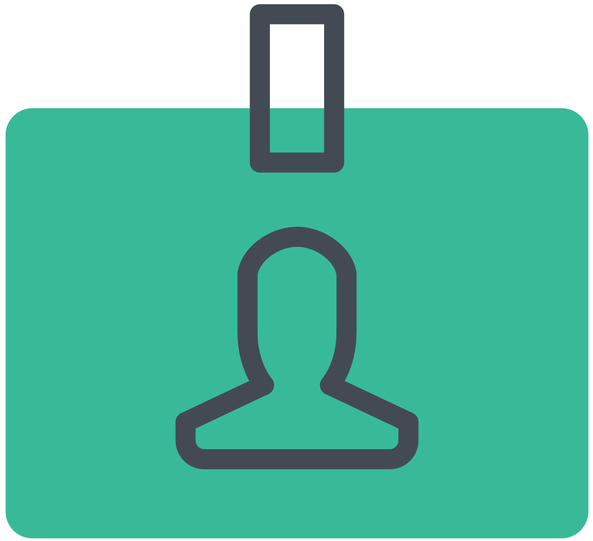

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Biometric

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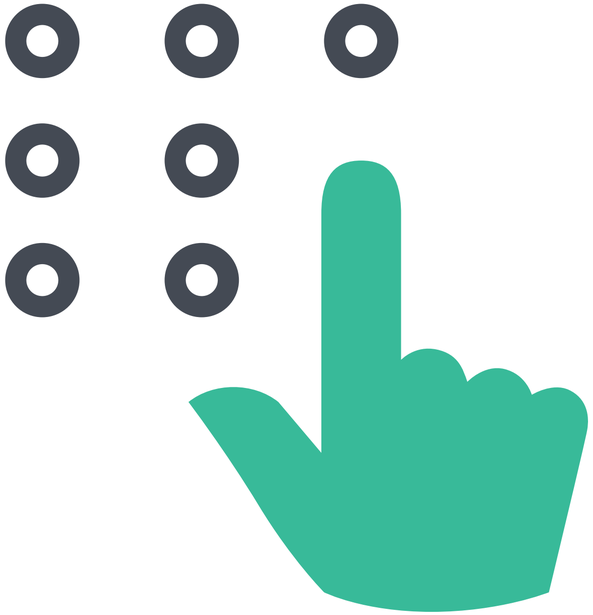

Something you know

- PIN
- Password
- Mother's Maiden Name

Something you have

- PIV / SmartCard
- FIDO2 hardware token
- Some other device

Something you are

- TouchID / FaceID
- Fingerprint scanner
- Retinal scanner

History

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History

macOS is UNIX

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“Passcodes and passwords are essential to the security of Apple devices.”

Apple Platform Security guide

HTTPS://SUPPORT.APPLE.COM/GUIDE/SECURITY/FACE-ID-AND-TOUCH-ID-SECURITY-SEC067EB0C9E/1/WEB/1

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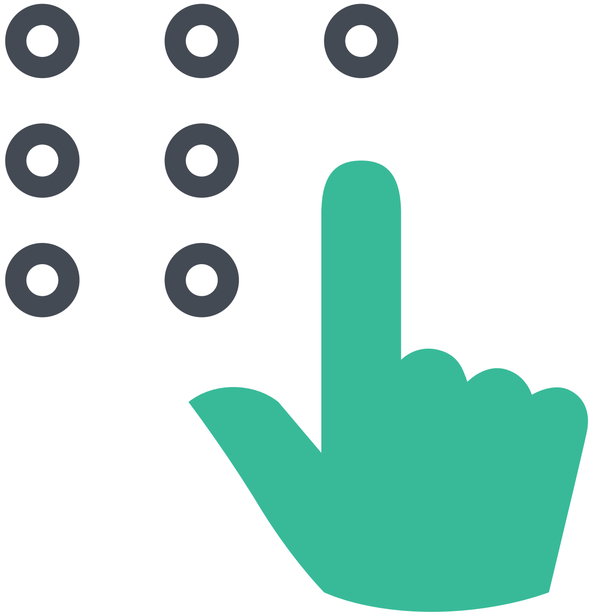

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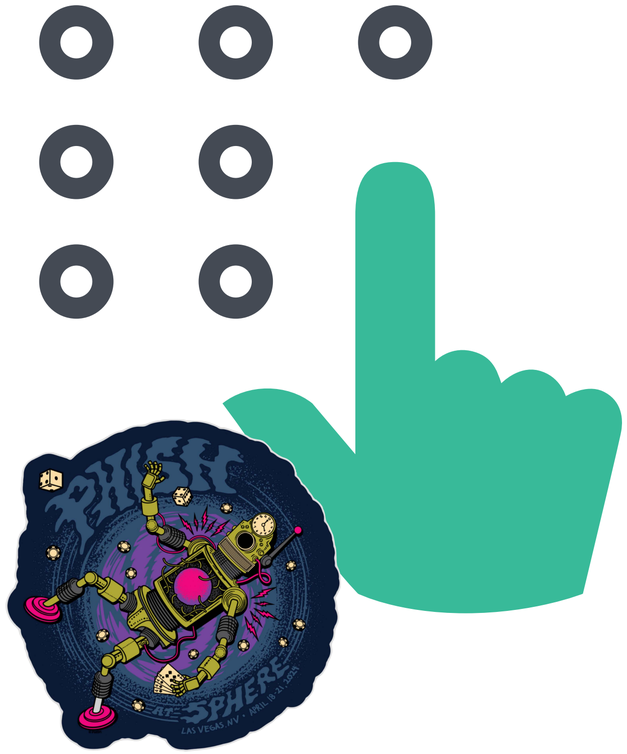
drygoods.phish.com



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“If **The Cloud** is just somebody else's server, **Passwordless** is just somebody else's hash.”

Sean Rabbitt

SR. CONSULTING ENGINEER, CIRCA 2022

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“With Face ID or Touch ID turned off, when a device or account locks, the keys for the highest class of Data Protection—which are held in the Secure Enclave—are discarded. The files and keychain items in that class are inaccessible until the user unlocks the device or account by entering their **passcode or password**.”

Apple Platform Security guide

HTTPS://SUPPORT.APPLE.COM/GUIDE/SECURITY/USES-FOR-FACE-ID-AND-TOUCH-ID-SECC5227FF3C/1/WEB/1

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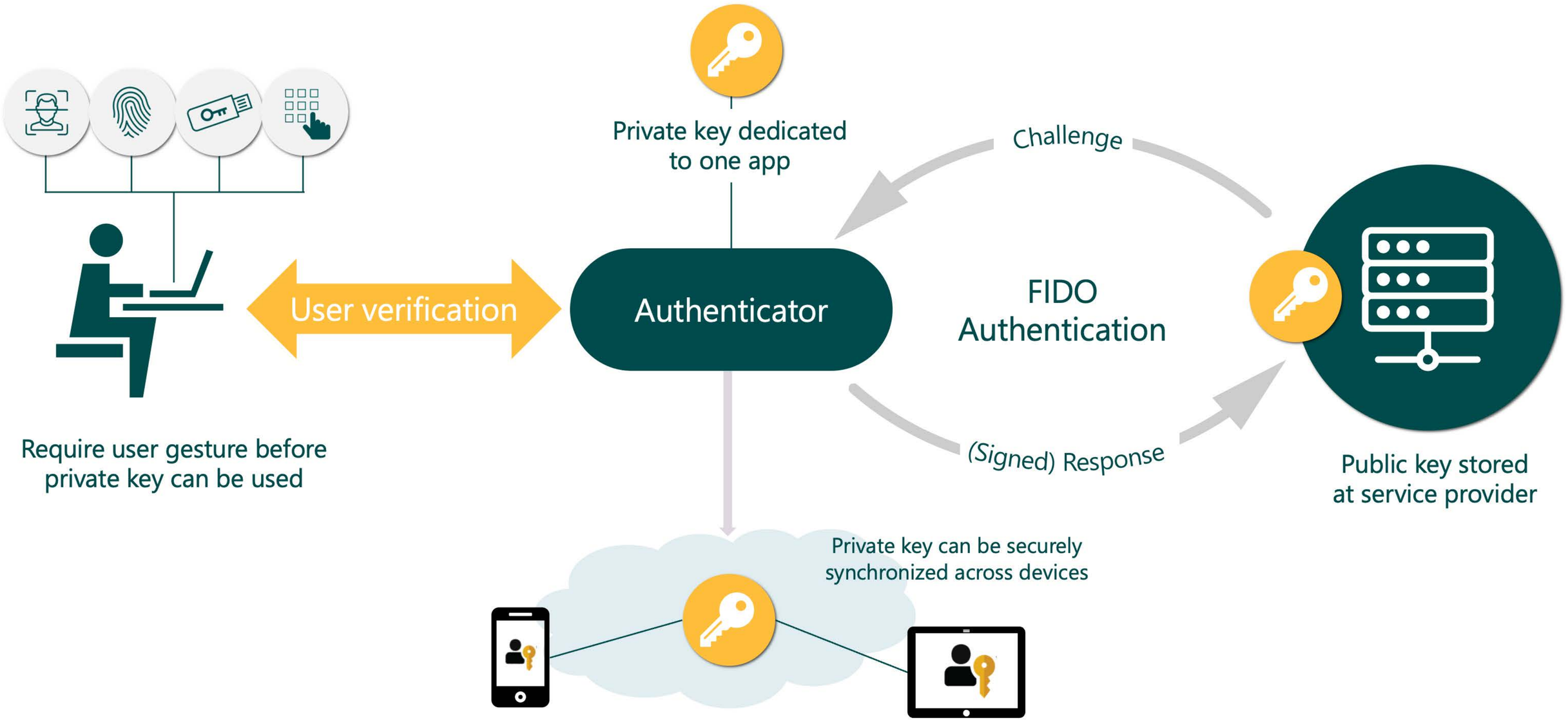

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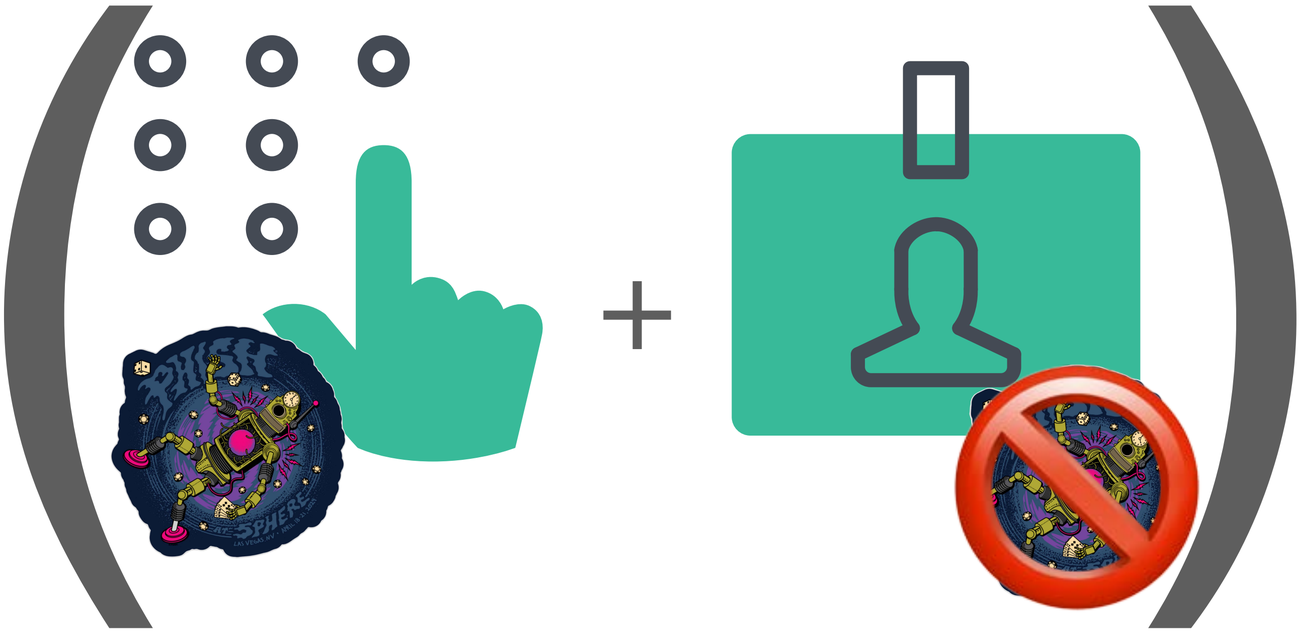

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- Knowledge based password reset procedures
- "Security" questions
- Untrained help desk
- SMS based factor resets
- Email based factor resets
- "My voice is my password. Verify me."

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What the heck is
Single Sign On

You mean that thing where I type my user name and password 27 times a day?

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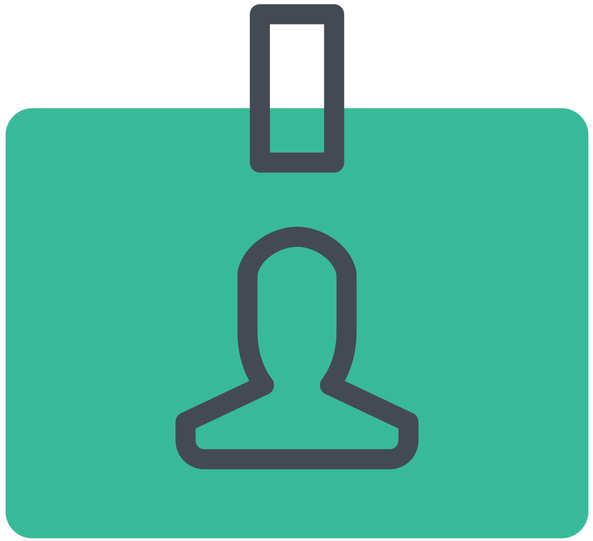
Apple Extensible Single Sign On

Knowledge



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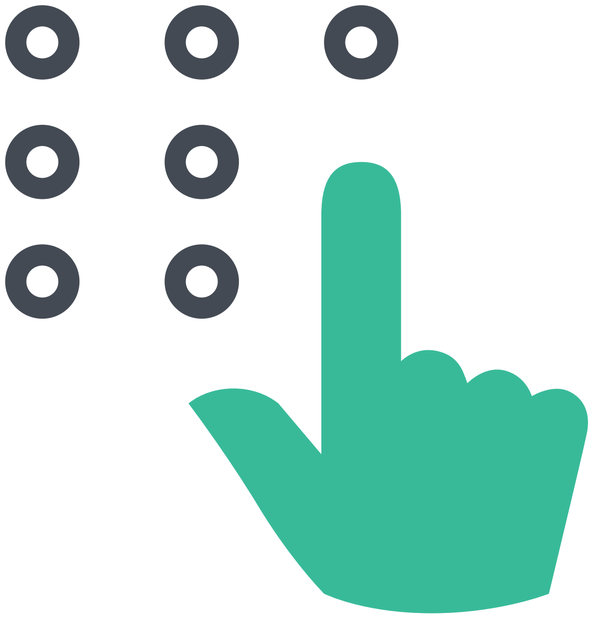

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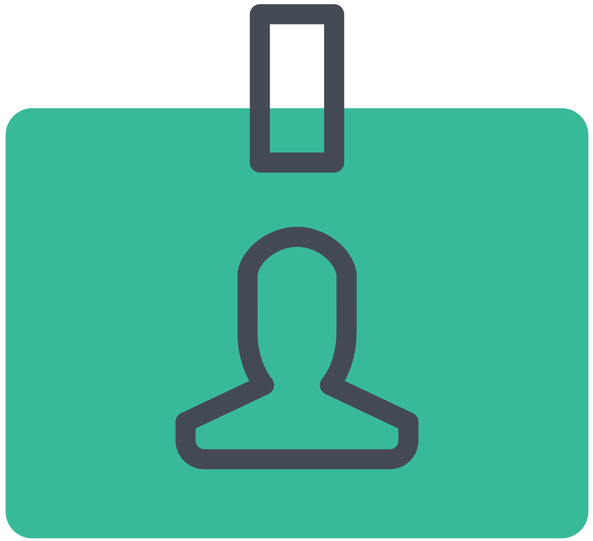

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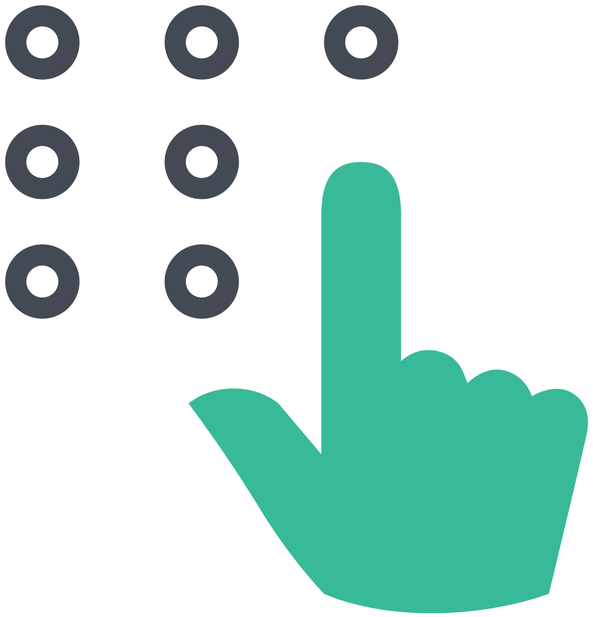

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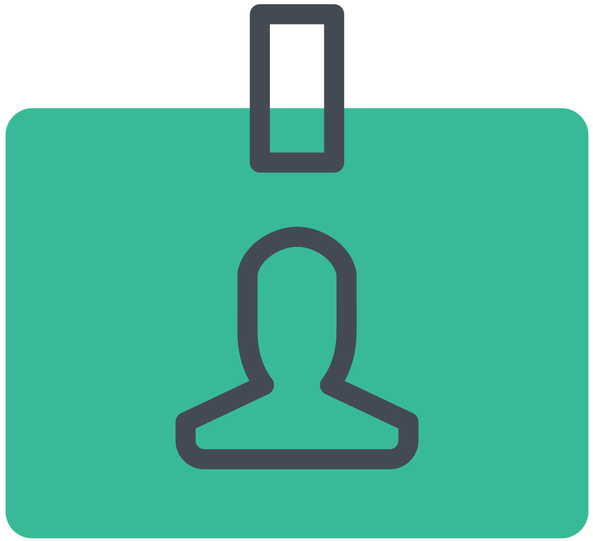

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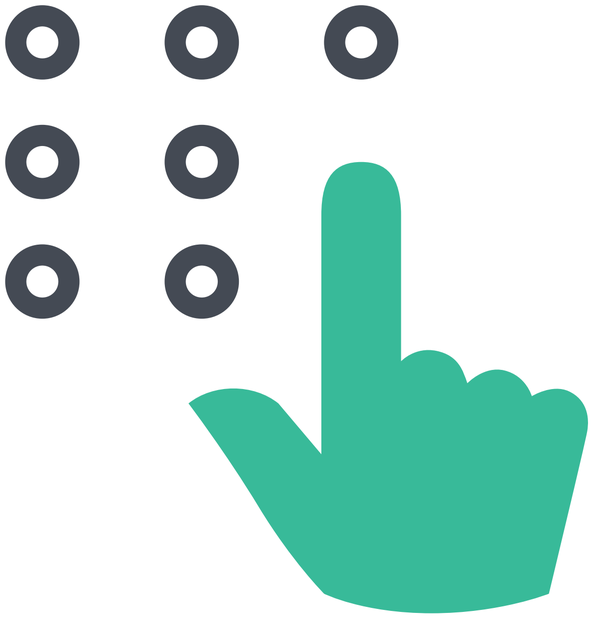

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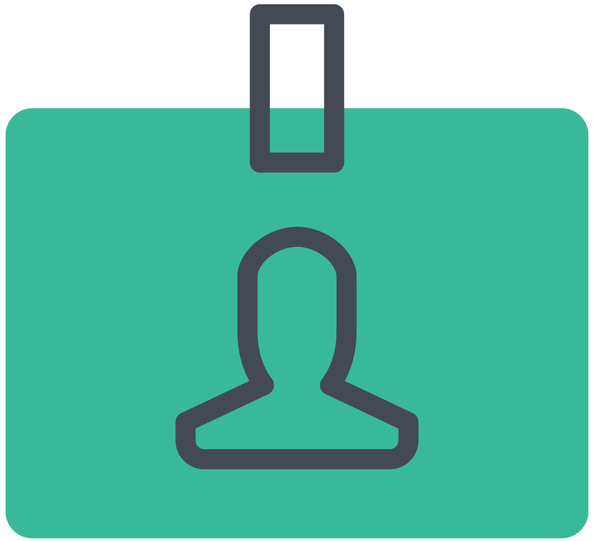

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Biometric

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Use words more gooder

- Kerberos Single Sign-On
- Extensible Single Sign-On - SSOe

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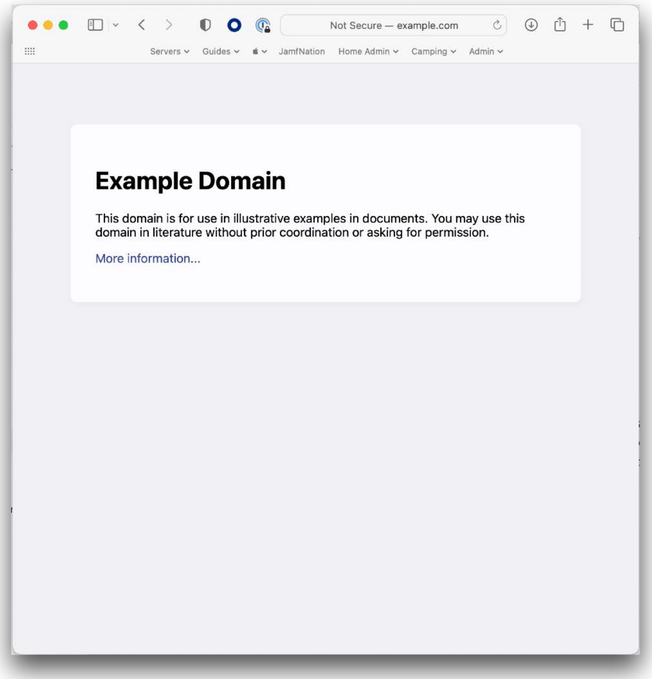
  - AuthenticationServices API - "credential"
  - URL interception method - "redirect"

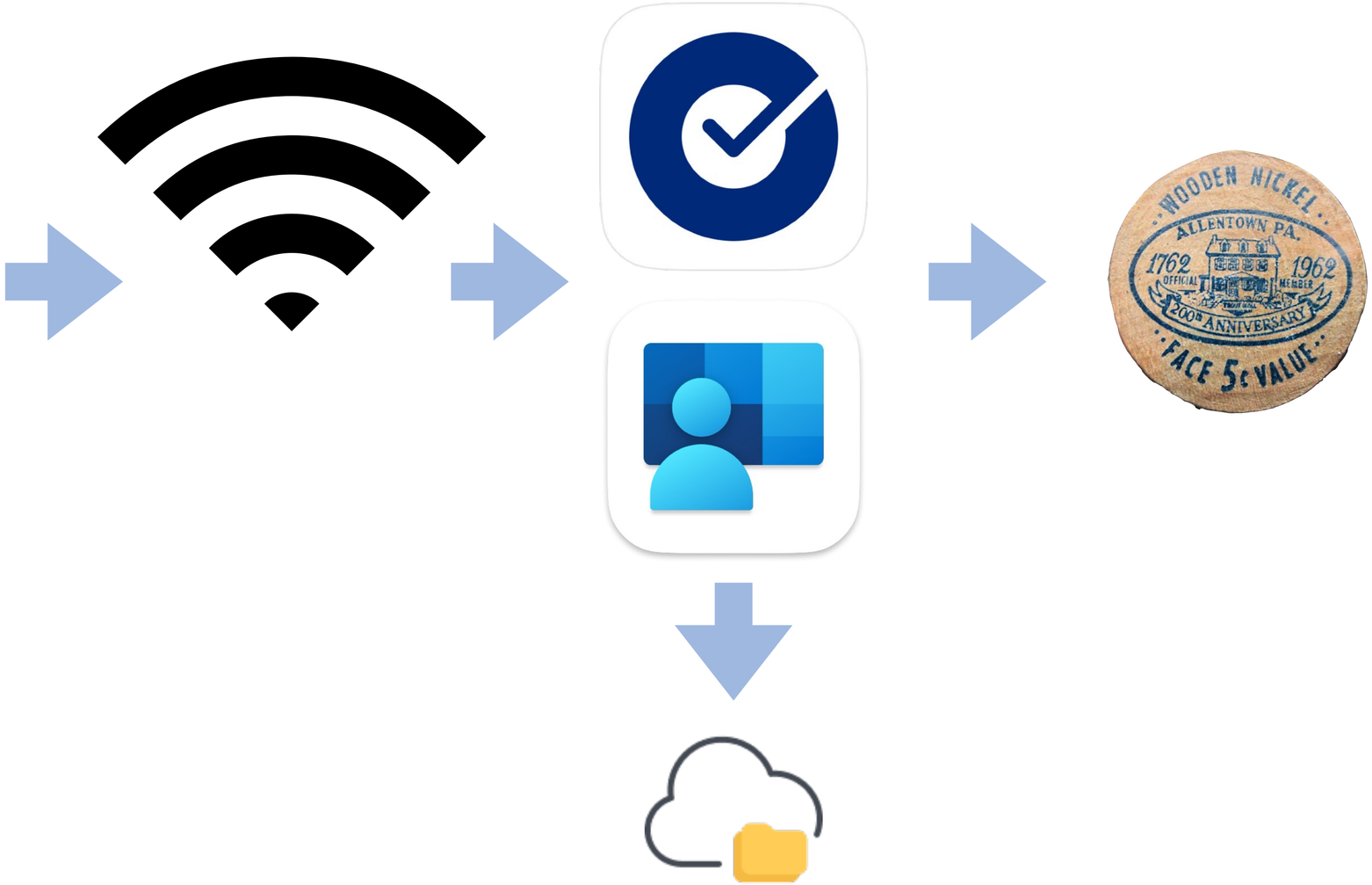
Use words more gooder

- Kerberos Single Sign-On
- Extensible Single Sign-On - SSOe
  - AuthenticationServices API - "credential"
  - URL interception method - "redirect"
- Enrollment Single Sign-On - "Enrollment SSO"
- Platform Single Sign-On - PSSOe

Extensible Single Sign-On



open https://example.com/login



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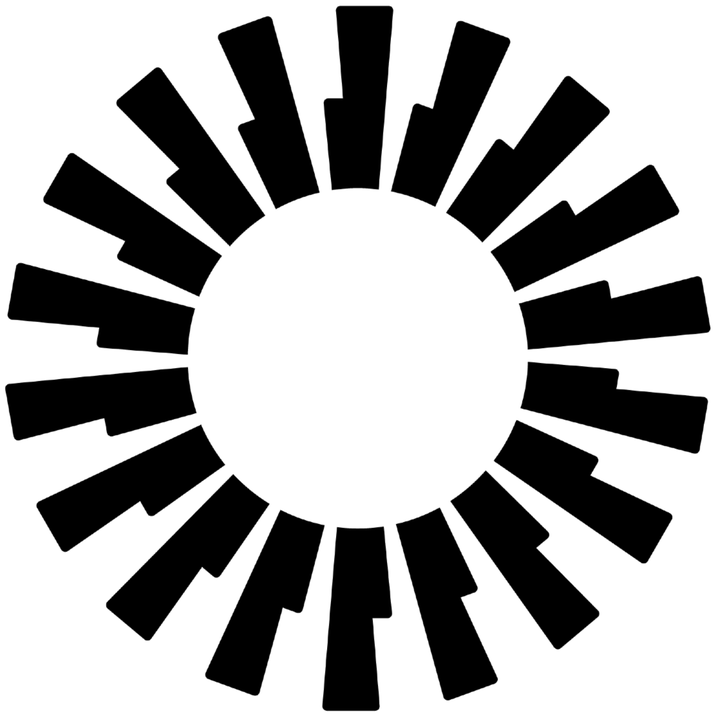
Microsoft Entra ID



Okta Identity Engine

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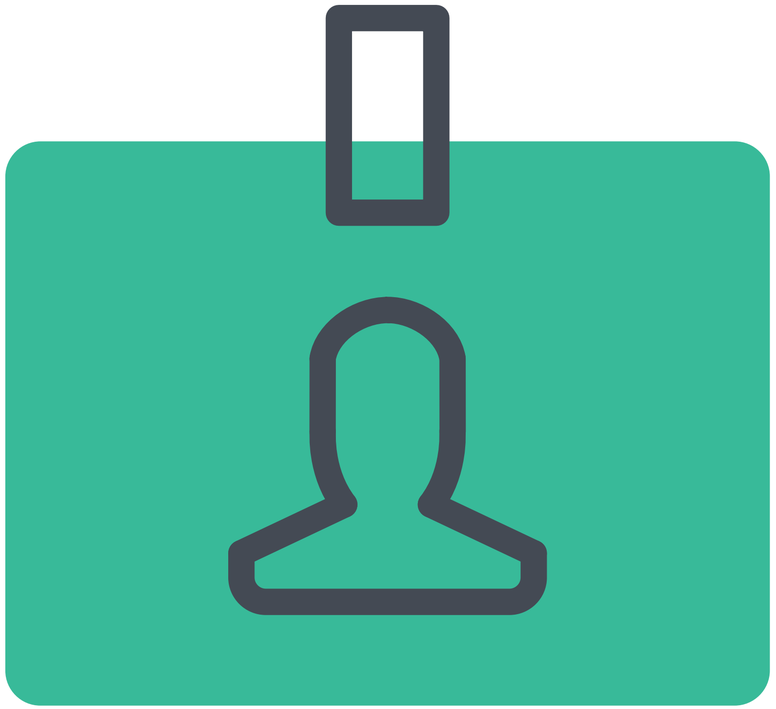
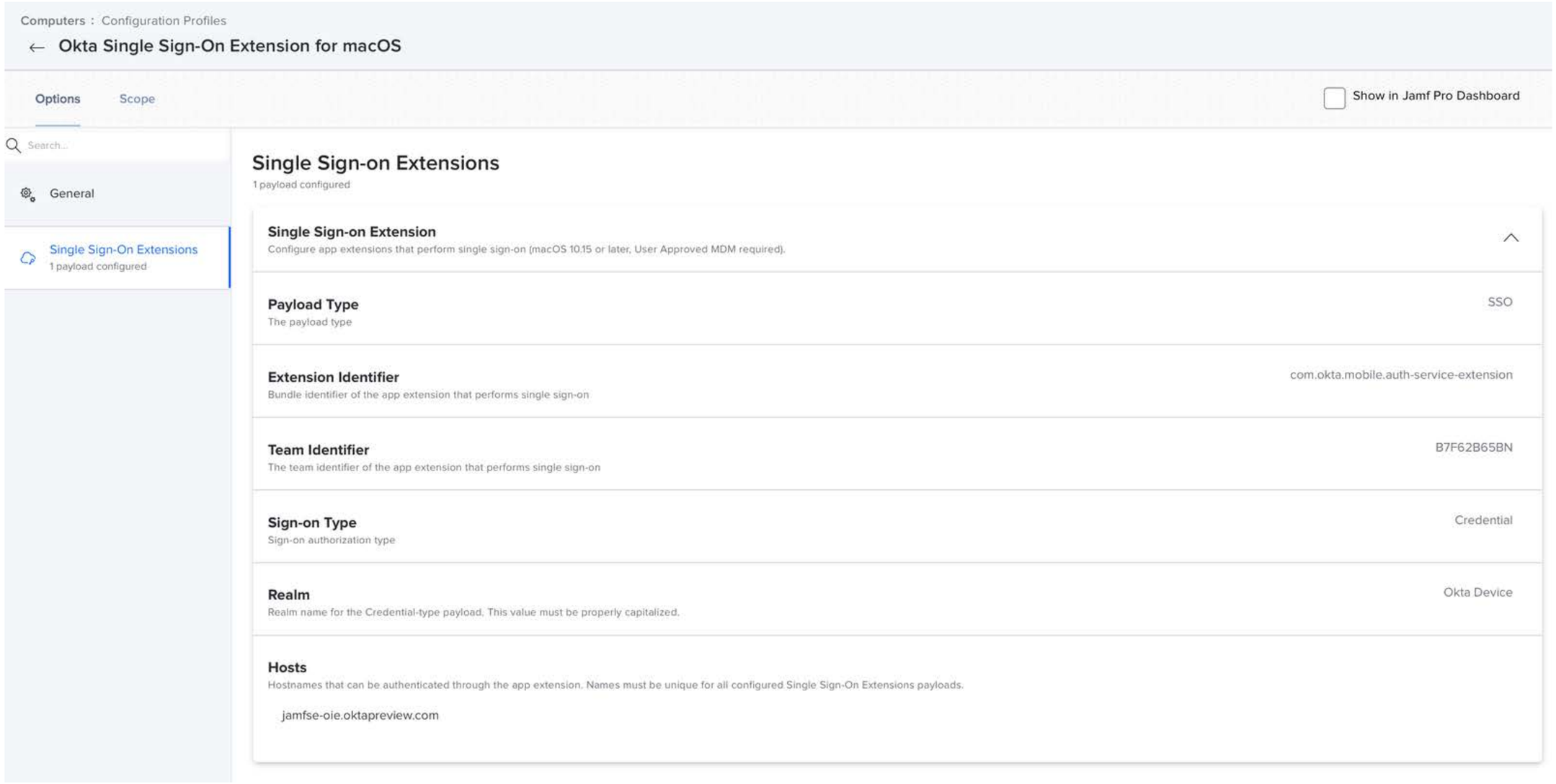
Single Sign On - A Possession Factor



- It's on a managed device
- It's only active via an MDM installed profile
- Once it's active.... it's active
- Works in Private Browsing mode

Extensible Single Sign-On



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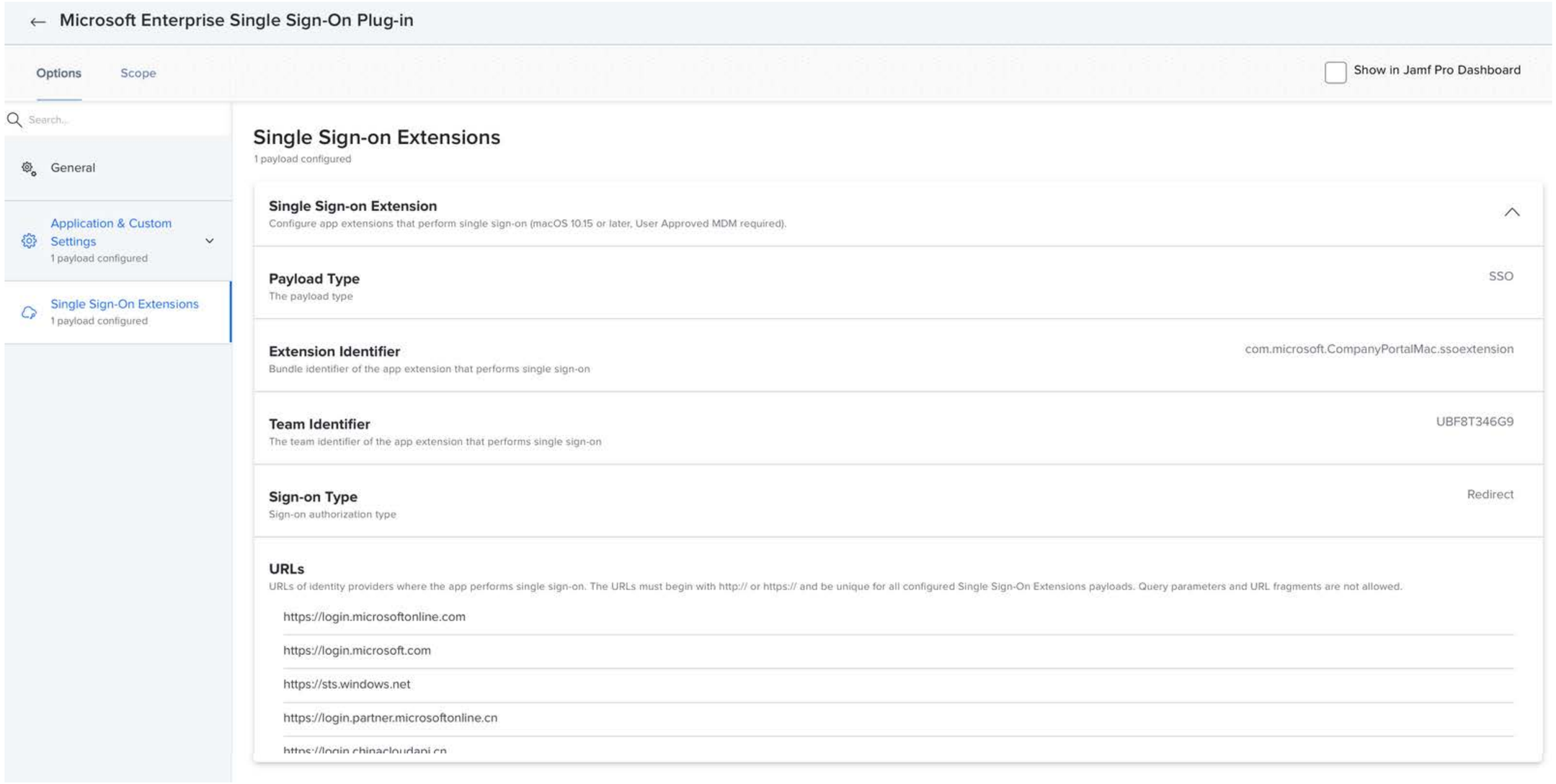
Extensible Single Sign-On



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Finder
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Safari File Edit View History Bookmarks Window Help
Wed Jun 12 10:59 AM
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Complete multifactor authentication registration to increase device security.
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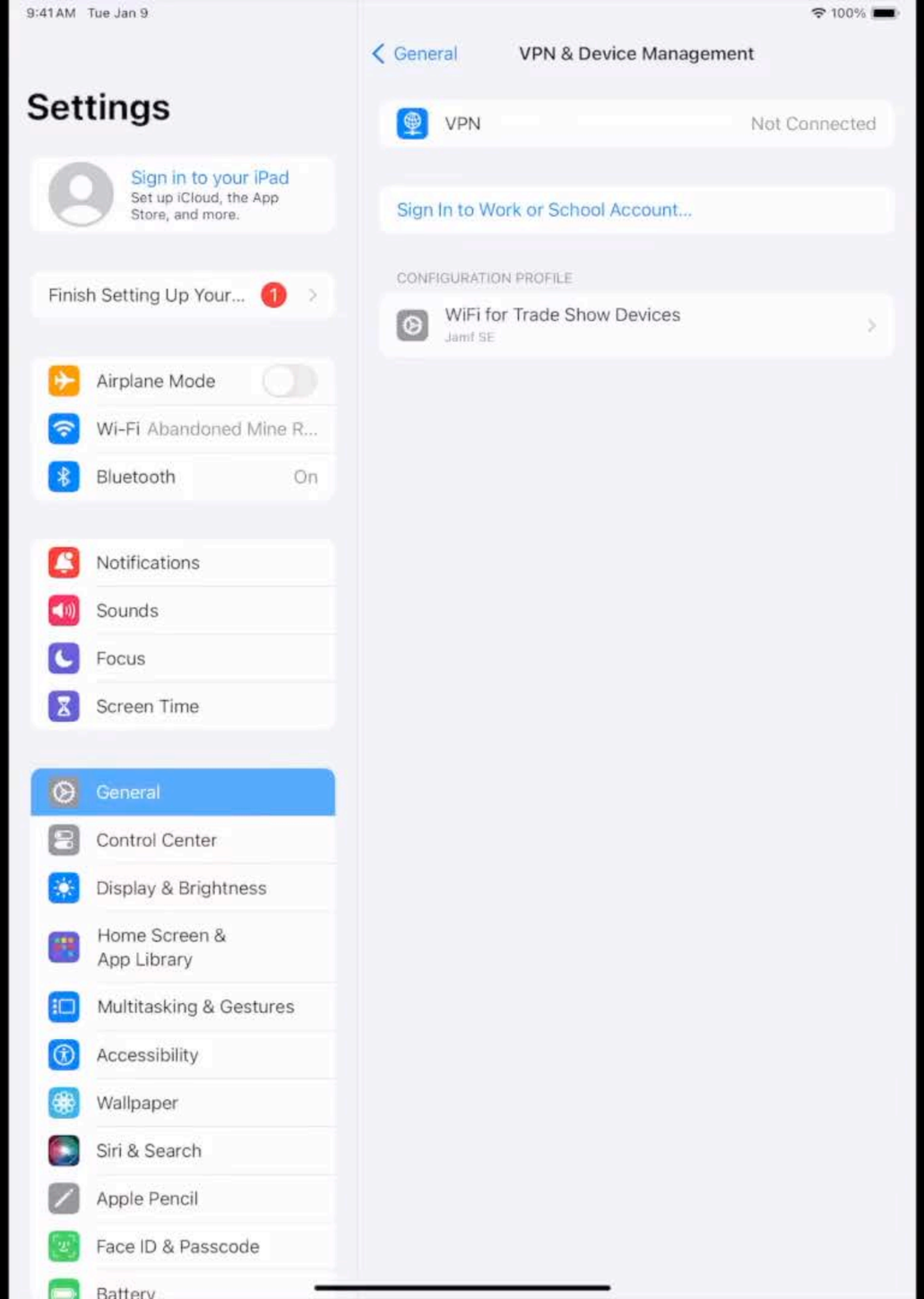
9:41 AM Tue Jan 9
100%
Settings
Sign in to your iPad
Set up iCloud, the App Store, and more.
Finish Setting Up Your... 1
Airplane Mode
Wi-Fi Abandoned Mine R...
Bluetooth On
Notifications
Sounds
Focus
Screen Time
General
Control Center
Display & Brightness
Home Screen & App Library
Multitasking & Gestures
Accessibility
Wallpaper
Siri & Search
Apple Pencil
Face ID & Passcode
Battery
General
VPN & Device Management
VPN Not Connected
Sign In to Work or School Account...
CONFIGURATION PROFILE
WiFi for Trade Show Devices
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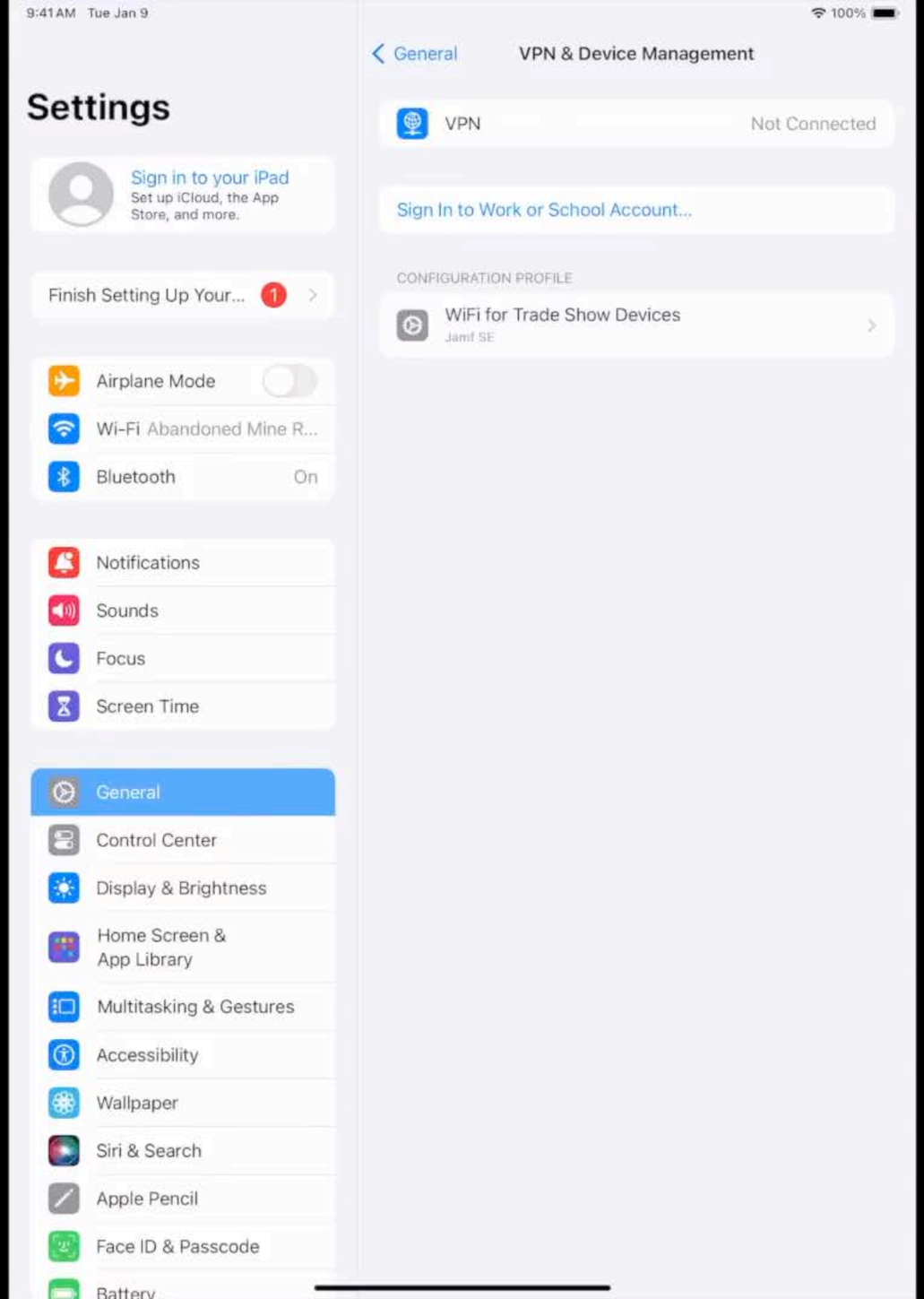
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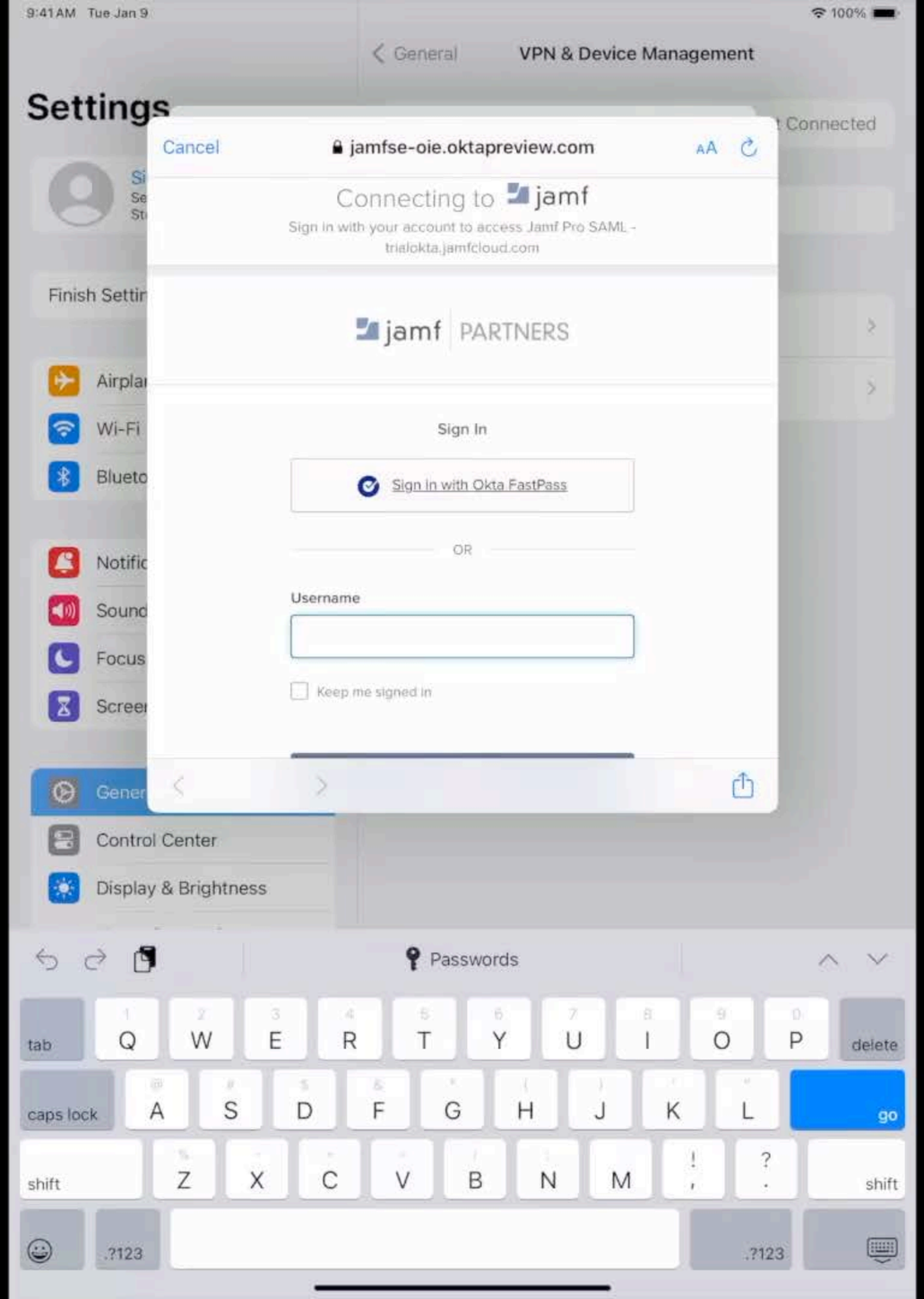
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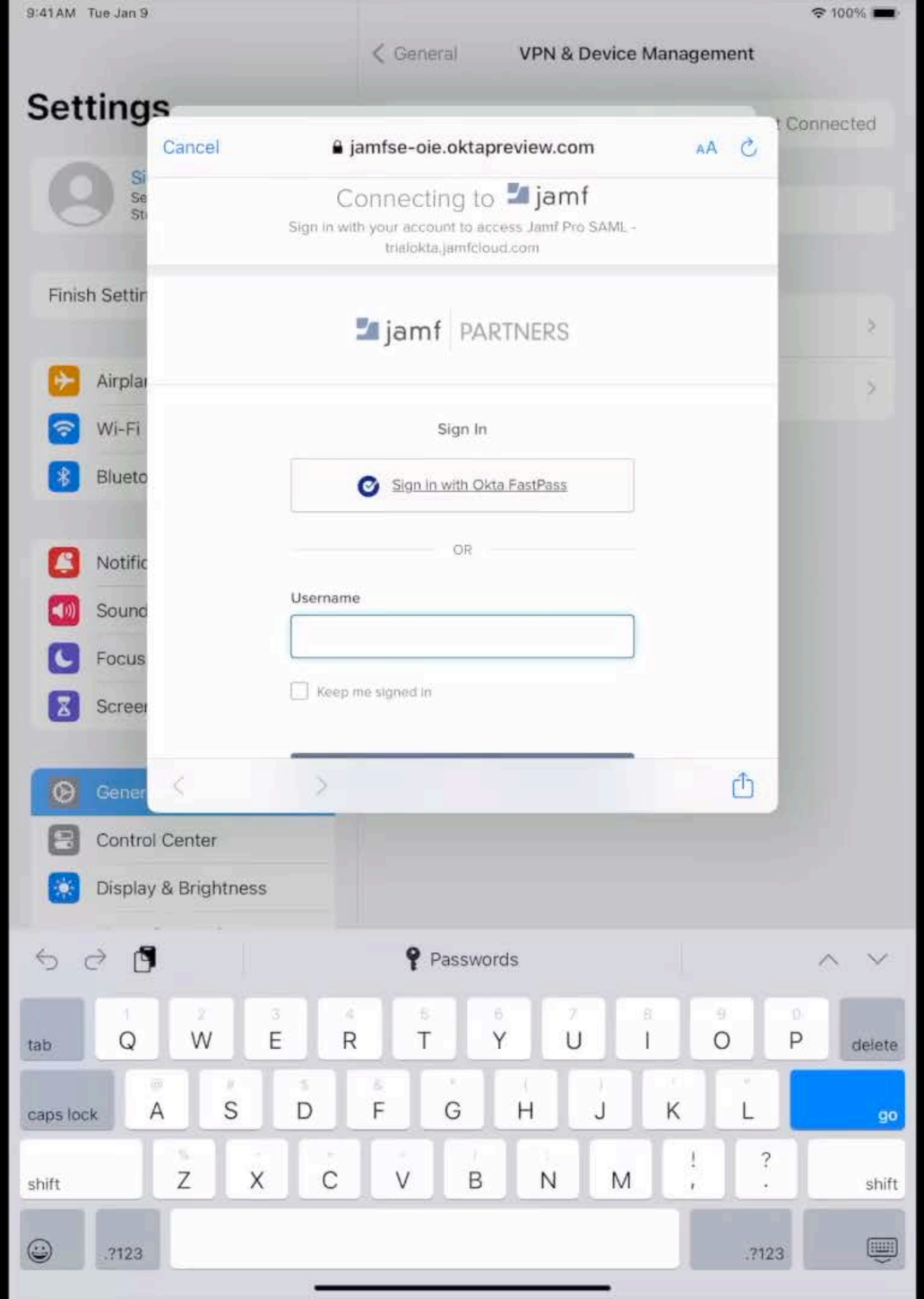
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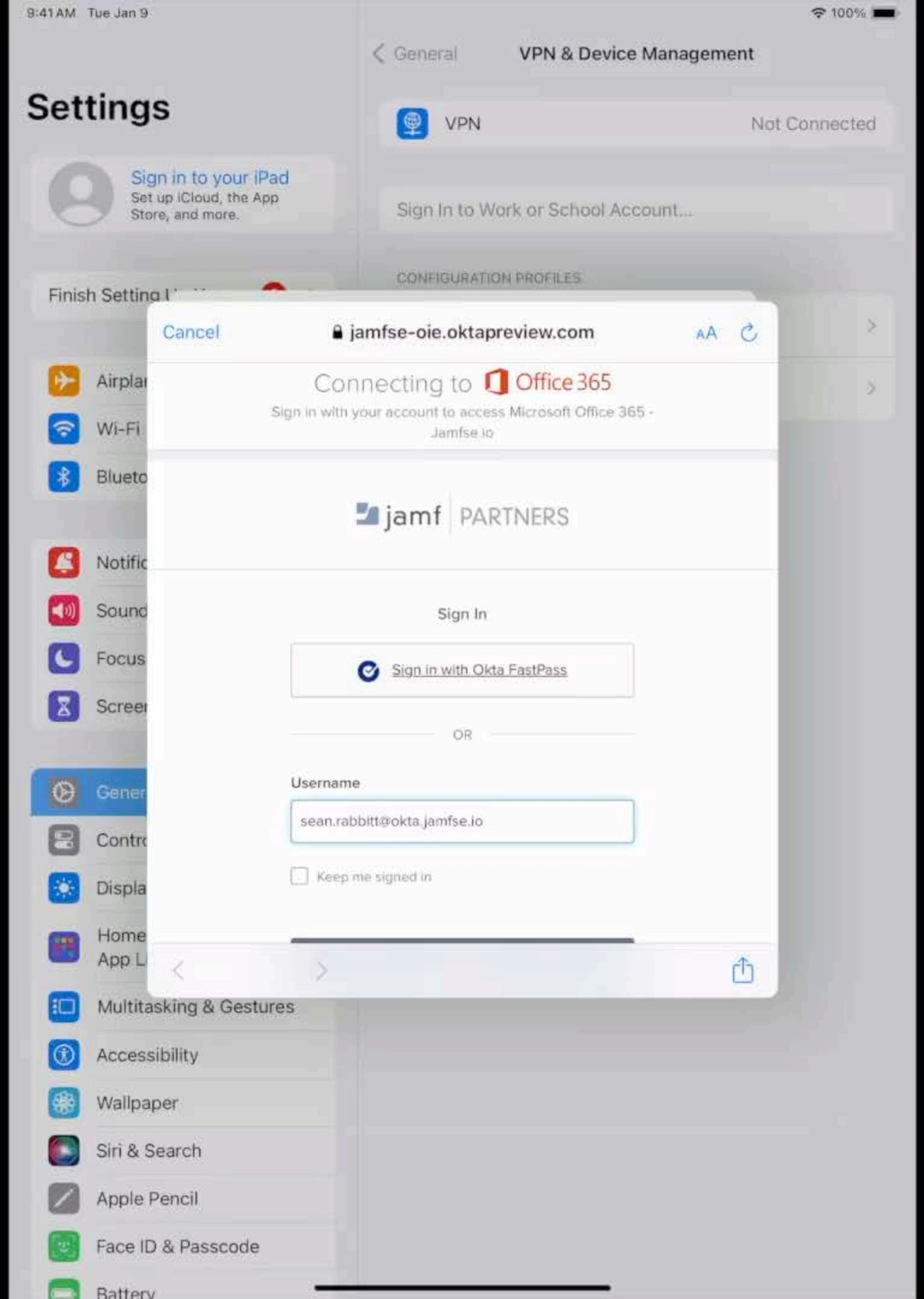
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Sign in with your account to access Microsoft Office 365 - Jamfse.io
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Sign in with Okta FastPass
OR
Username
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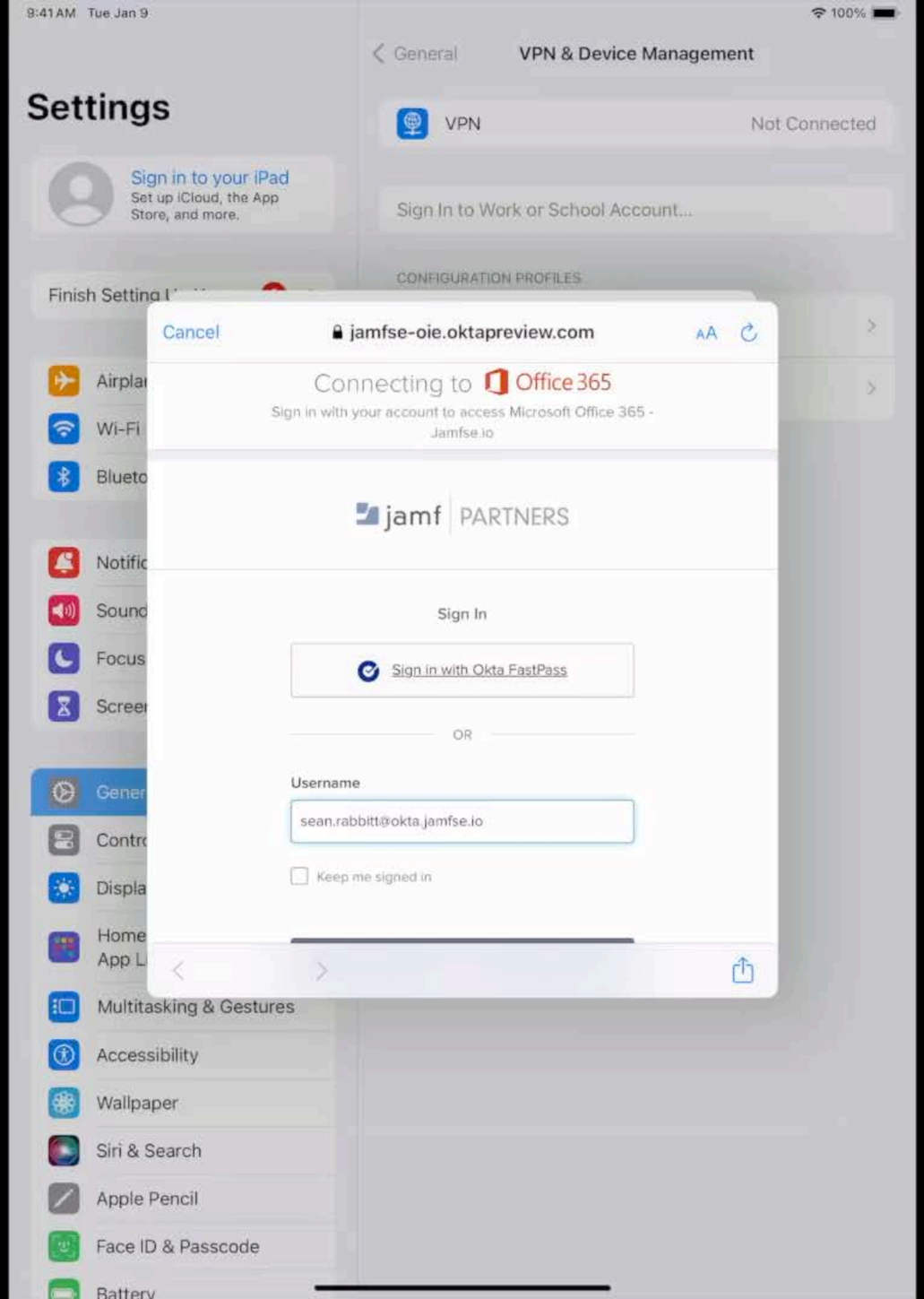
Keep me signed in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AA
Connecting to Office 365
Sign in with your account to access Microsoft Office 365 - Jamfse.io
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Sign In
Sign in with Okta FastPass
OR
Username
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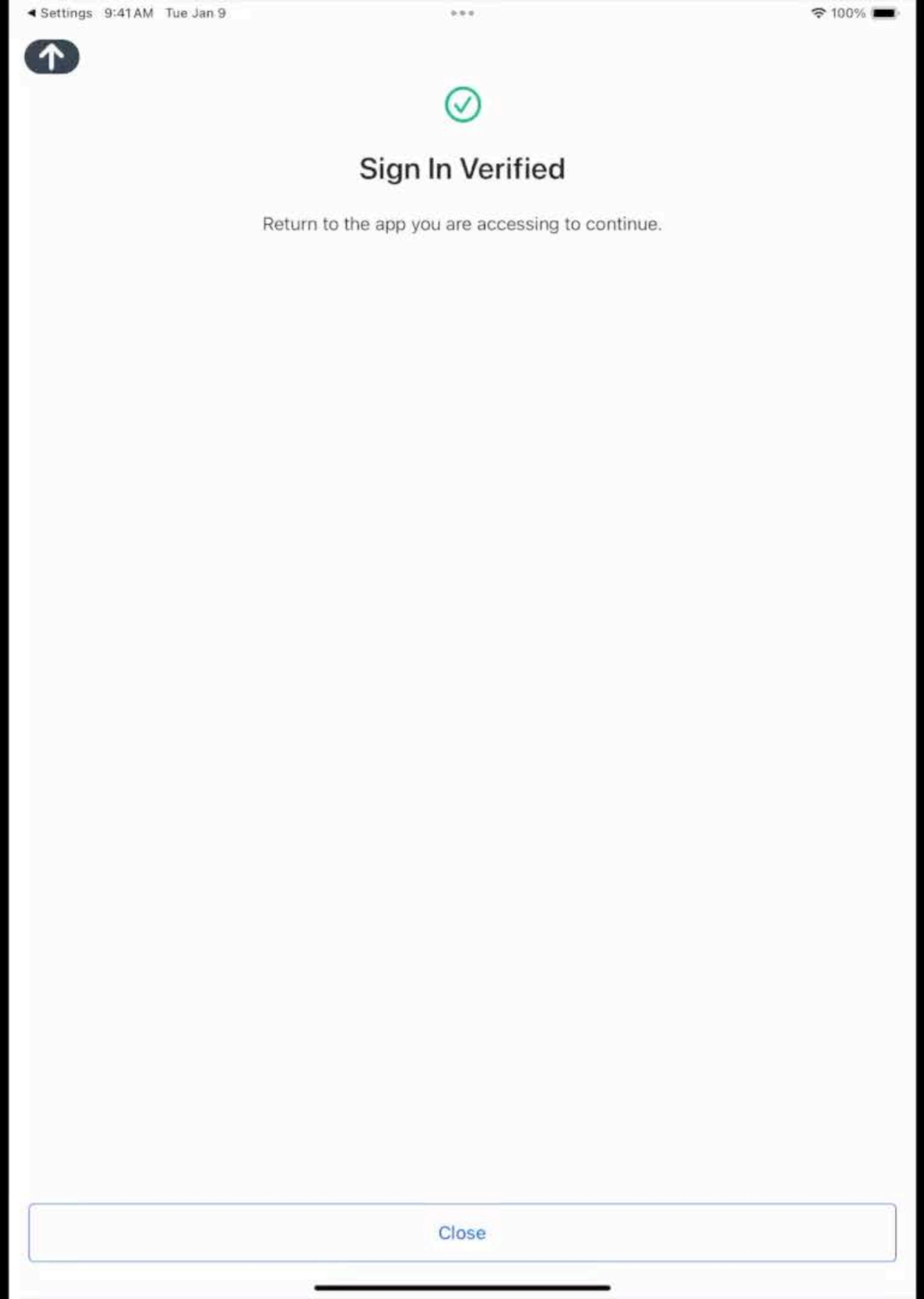
Keep me signed in


Settings 9:41 AM Tue Jan 9
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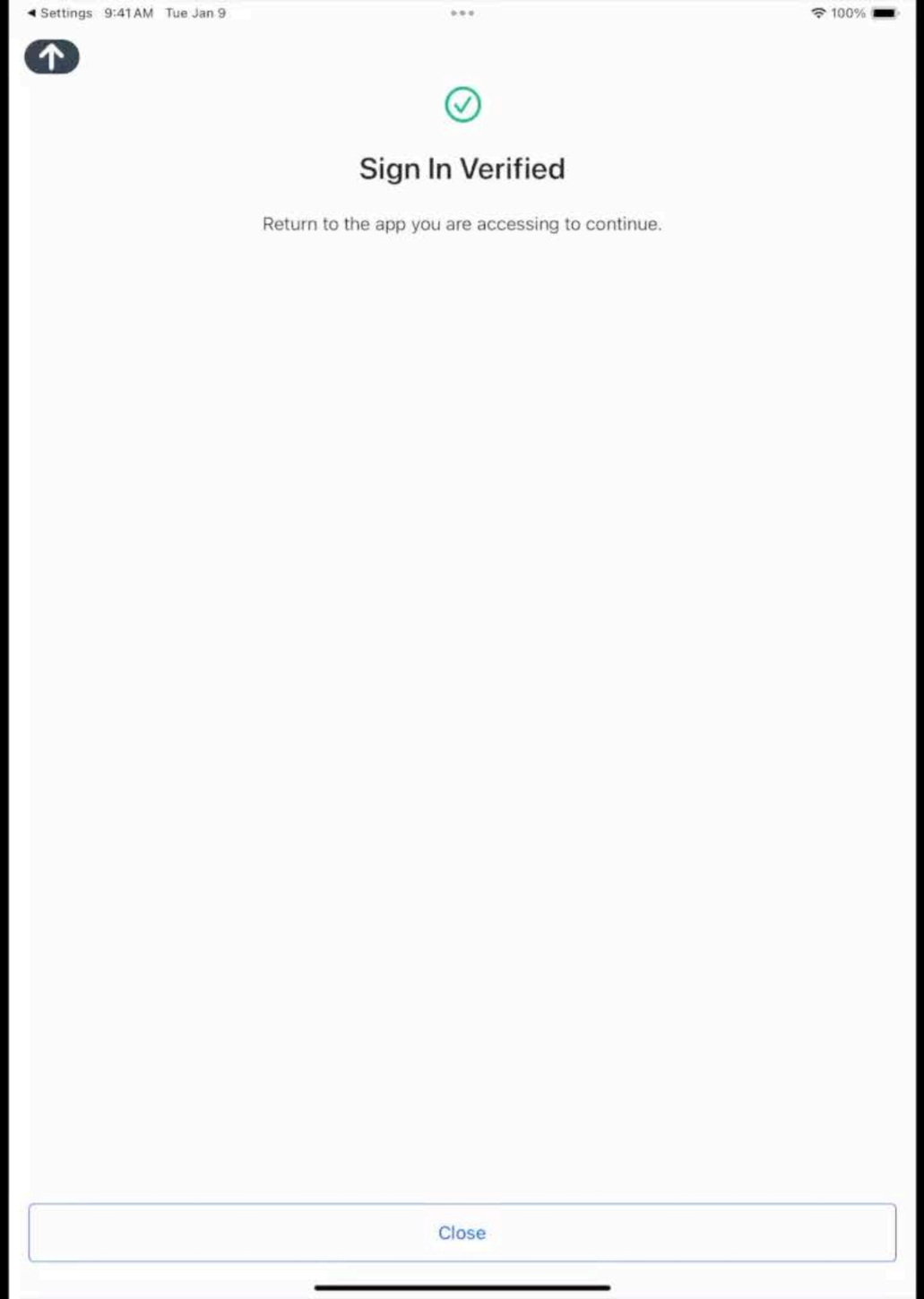
Sign In Verified
Return to the app you are accessing to continue.
Close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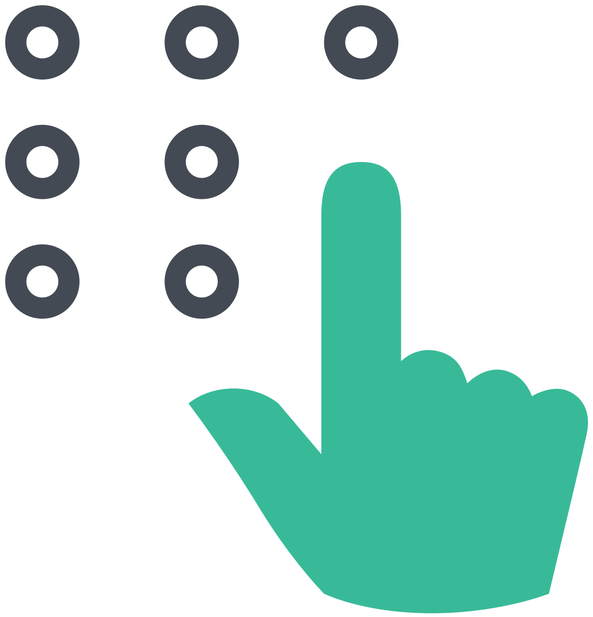

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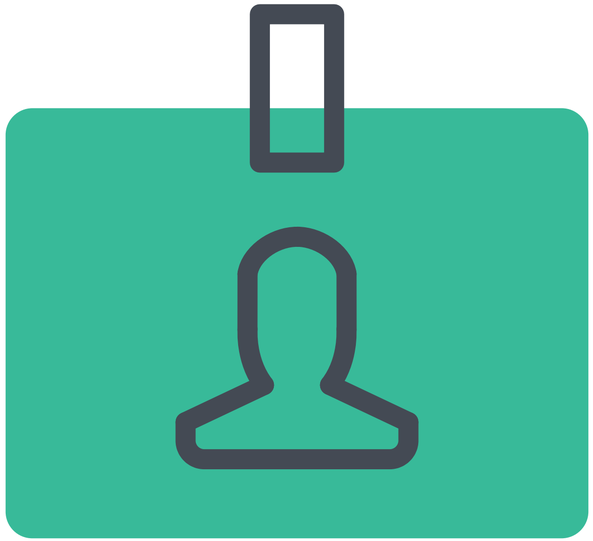

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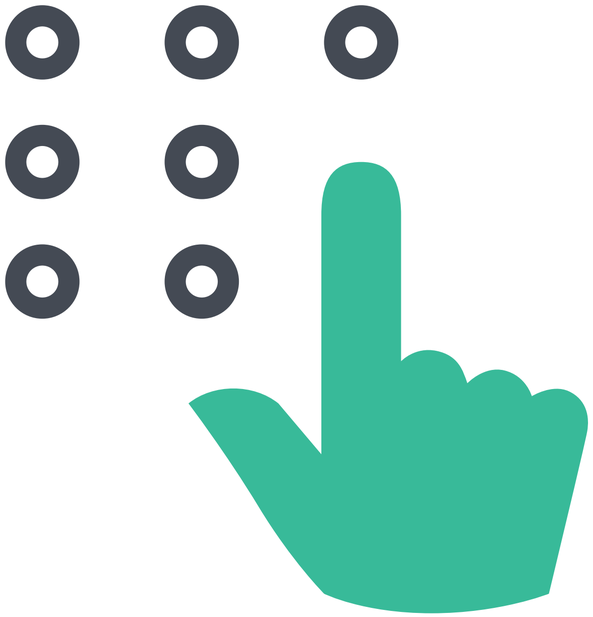

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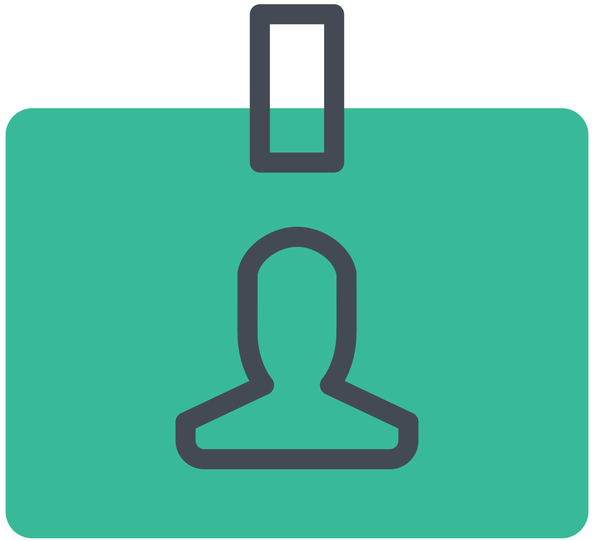

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With one major exception.....

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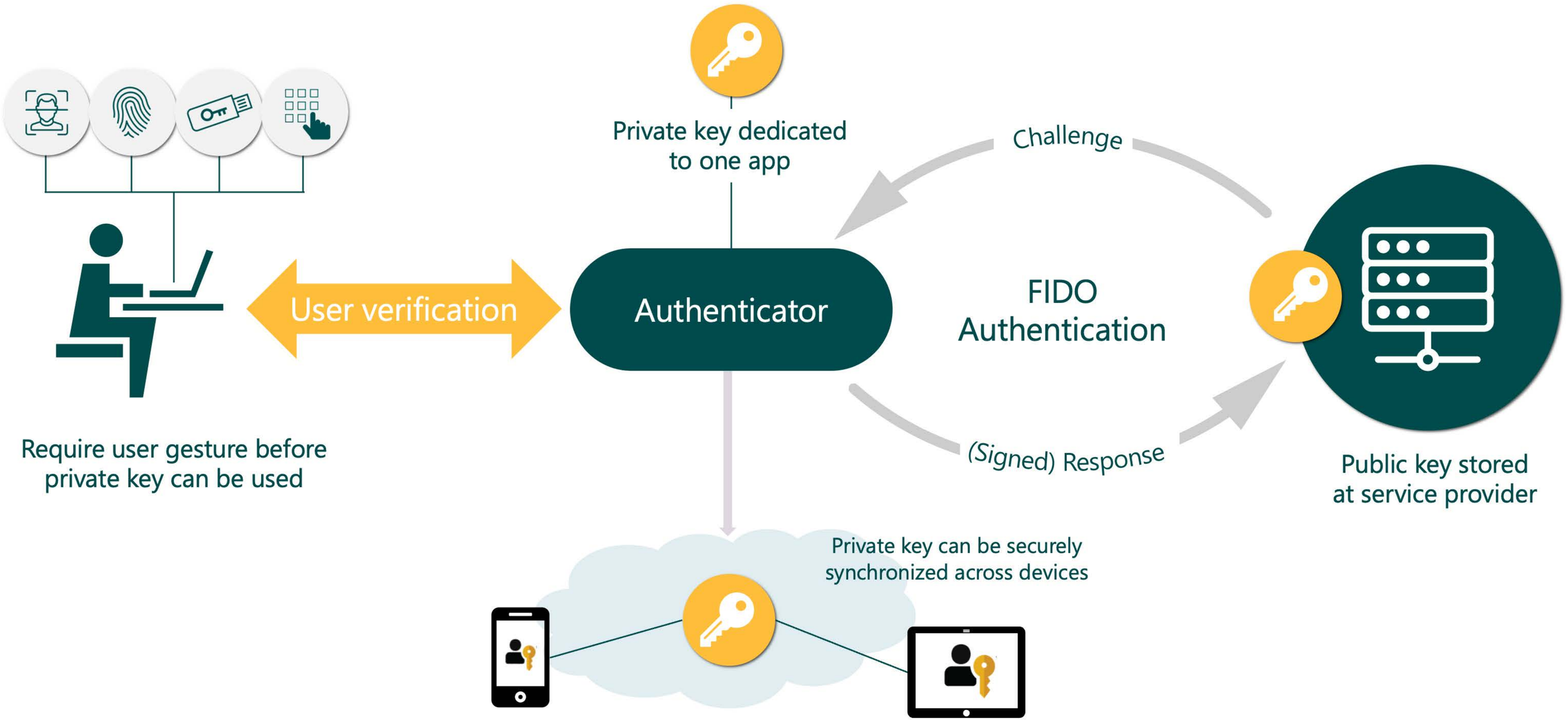

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Require user gesture before private key can be used

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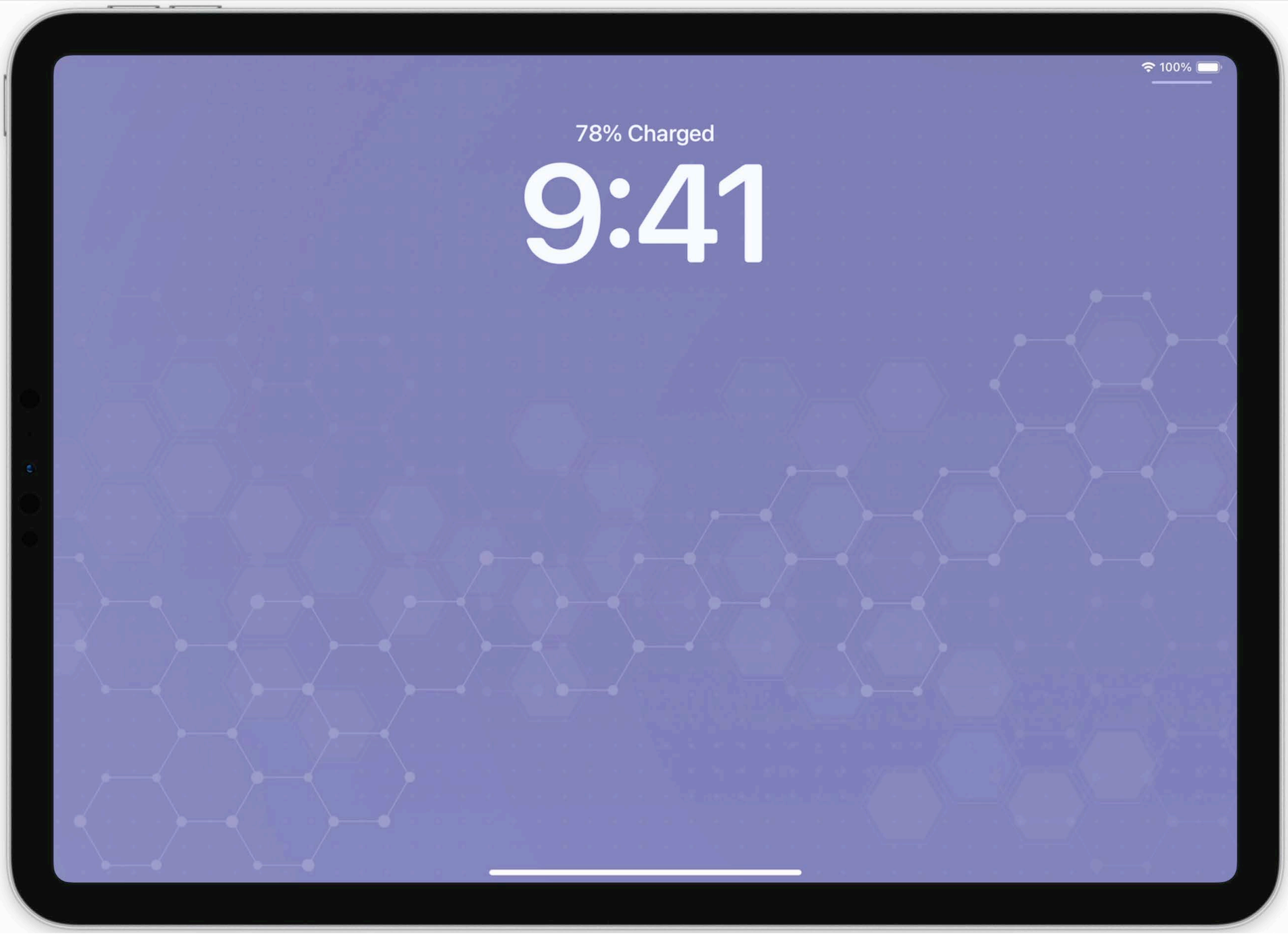
FIDO Seminar at RSAC: The State of Authentication 2024:the Global Progress Past Passwords
https://fidoalliance.org/content-presentations-fido-seminar-at-rsac-2024/



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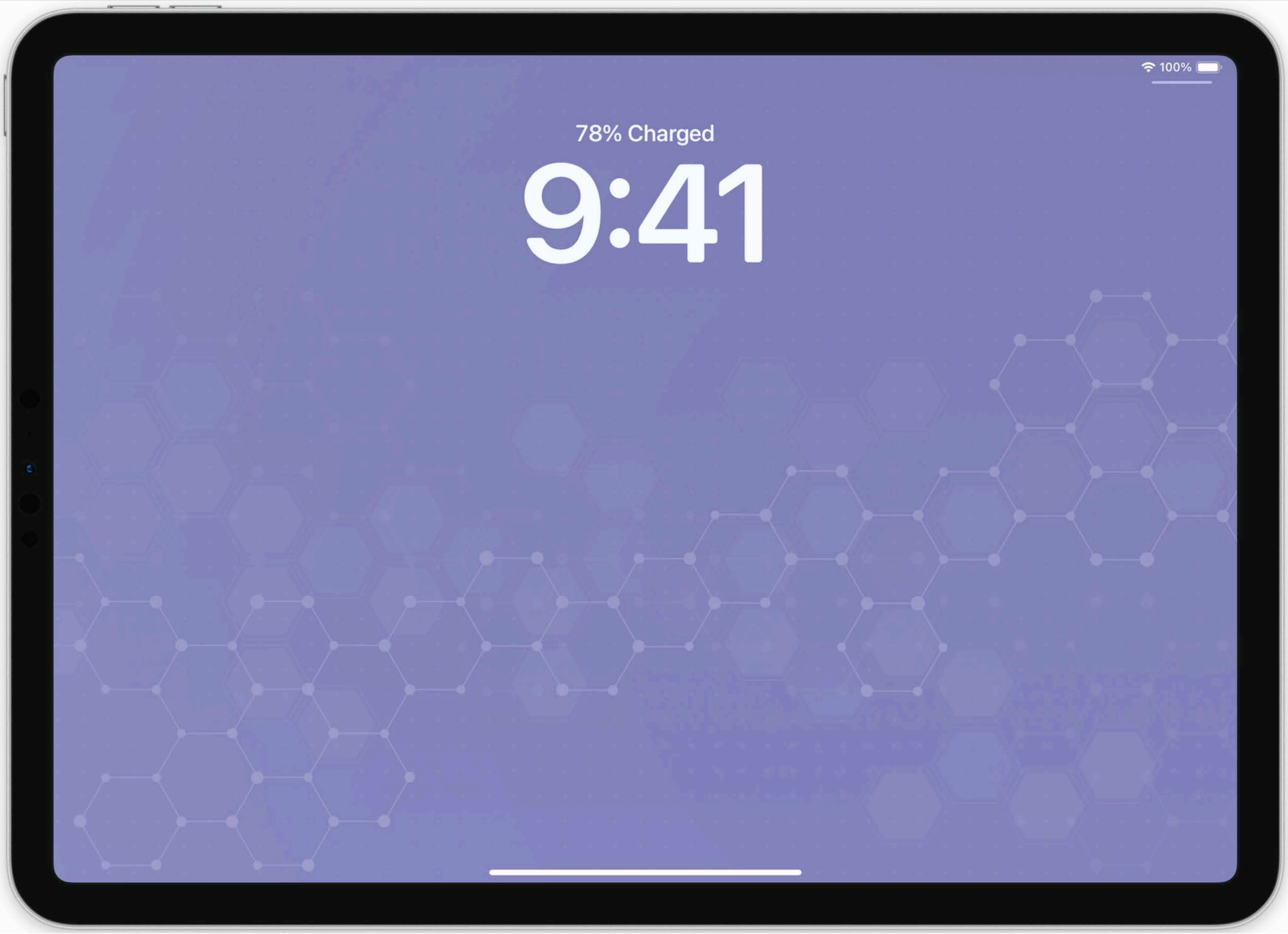
Bezel ❤️

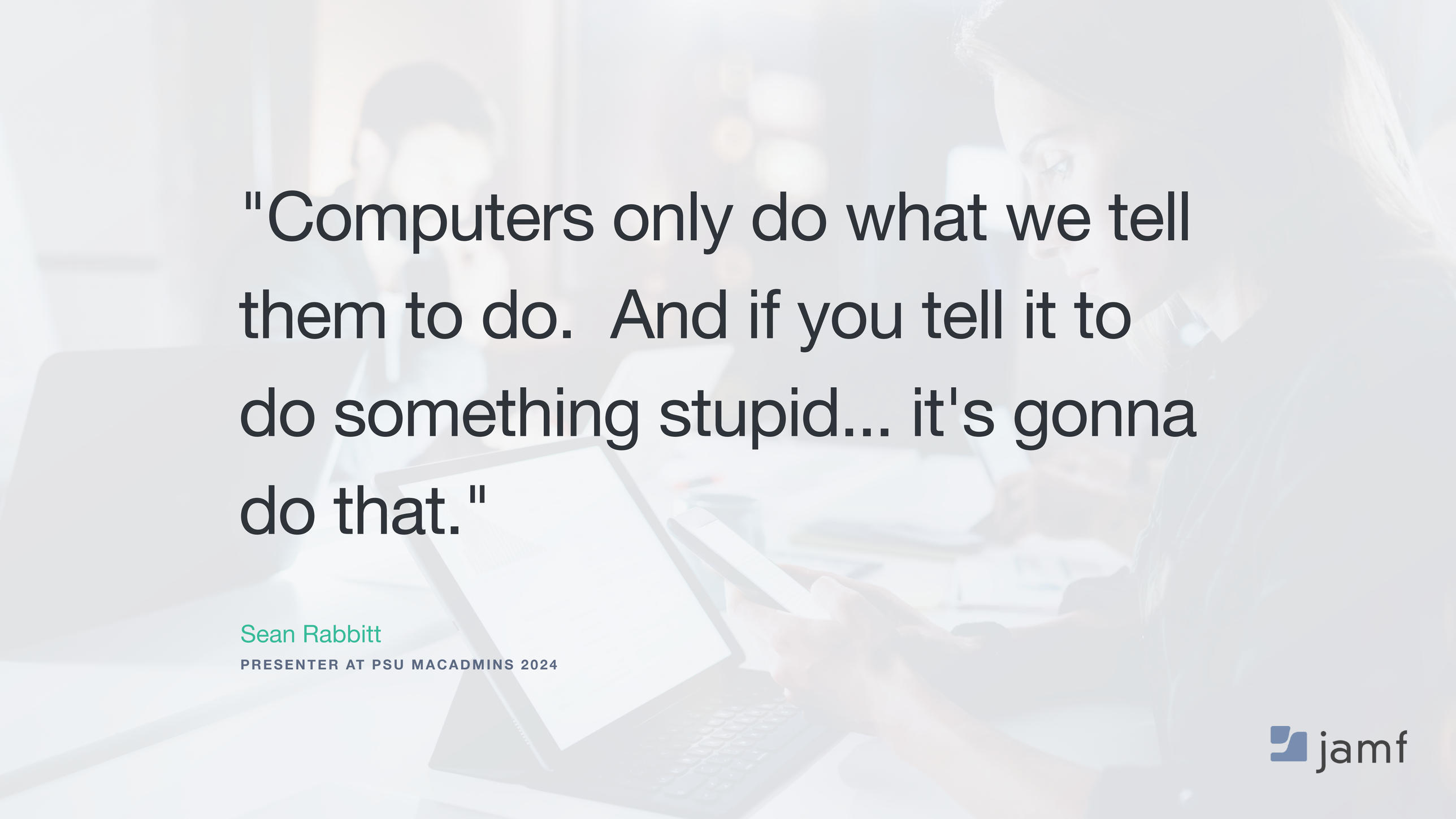
Sherlocked June 10, 2024



jamf

Bezel ❤️

Sherlocked June 10, 2024



"Computers only do what we tell them to do. And if you tell it to do something stupid... it's gonna do that."

Sean Rabbitt

PRESENTER AT PSU MACADMINS 2024

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Single Sign On does not have a mandatory requirement for **User Verification**

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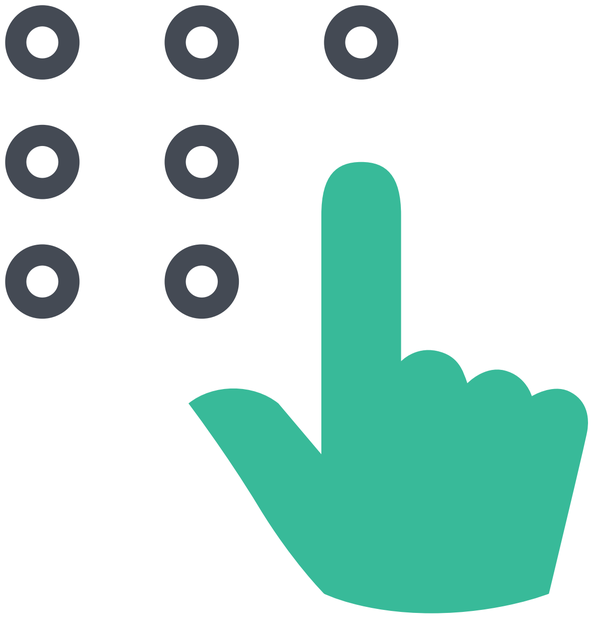

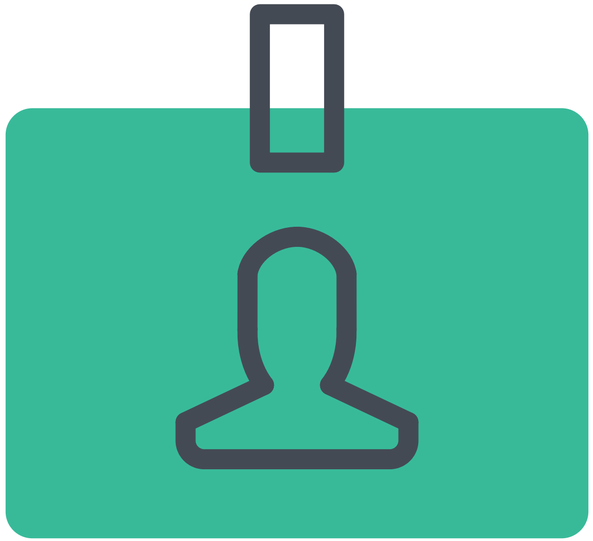

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Hardening with authentication rules and additional factors

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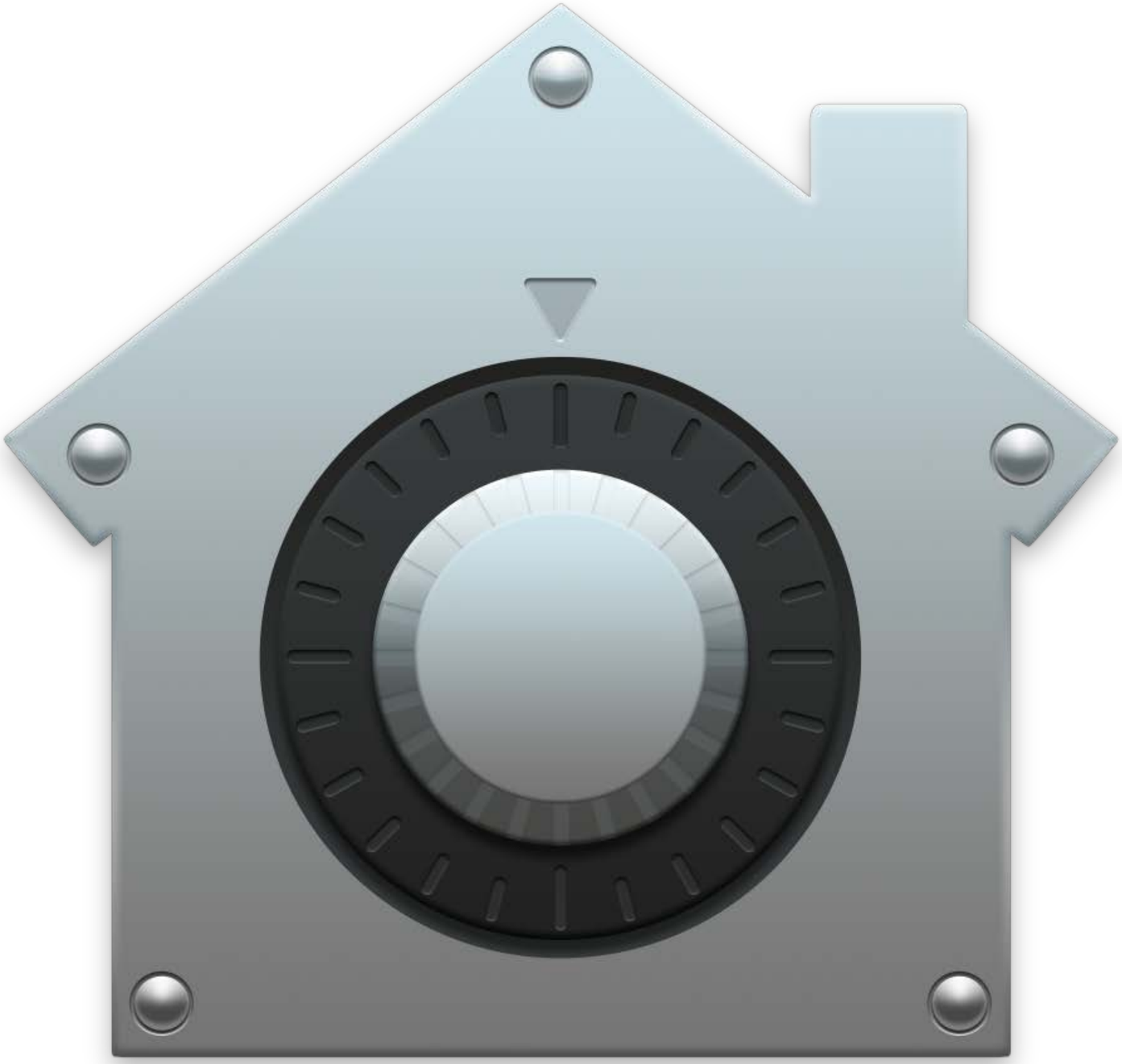

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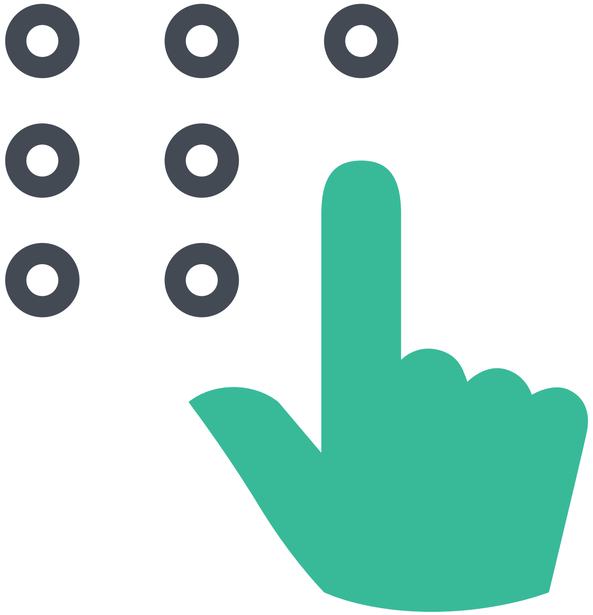

Something you know

- PIN
- Password
- ~~Mother's Maiden Name~~

Something you have

- PIV / SmartCard
- ~~FIDO2 hardware token~~
- ~~Some other device~~

~~Something you are~~

- ~~TouchID / FaceID~~
- ~~Fingerprint scanner~~
- ~~Retinal scanner~~

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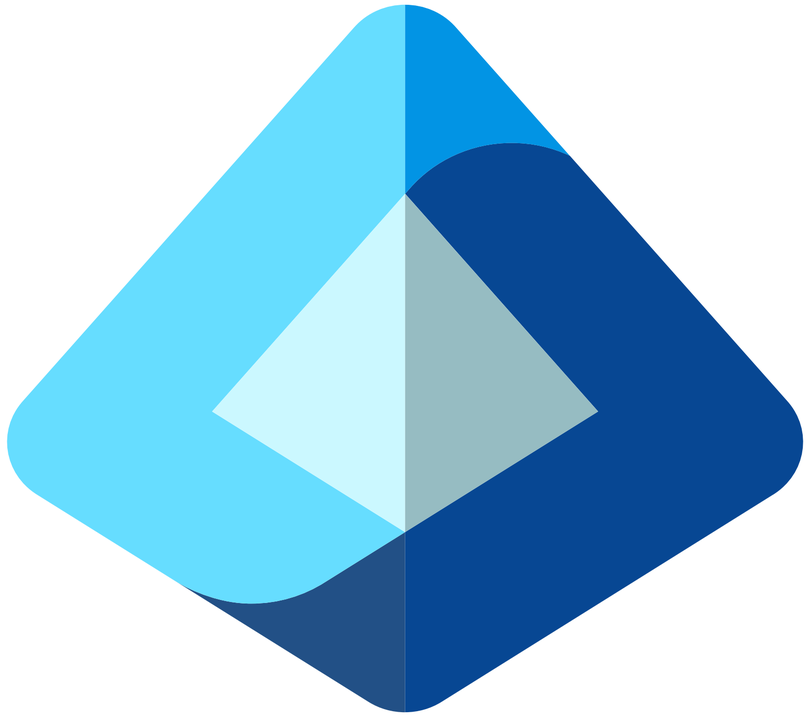

Microsoft Entra ID -> Security

- Enable authentication methods
  - FIDO2 key
  - Microsoft Authenticator
  - OAUTH tokens
  - Cert based
  - Passkey

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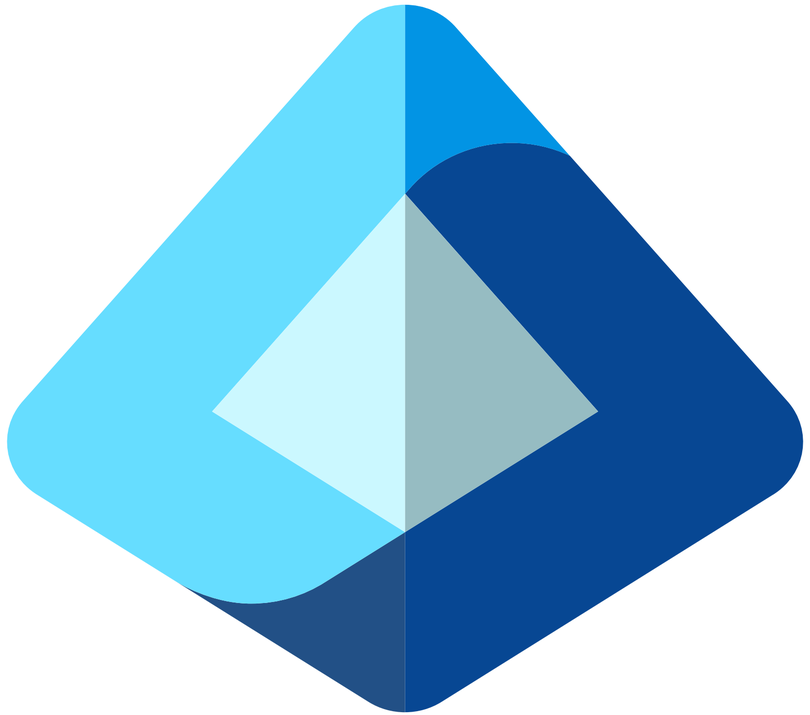

Microsoft Entra ID -> Security

- Enable authentication methods
  - FIDO2 key
  - Microsoft Authenticator
  - OAUTH tokens
  - Cert based
  - Passkey

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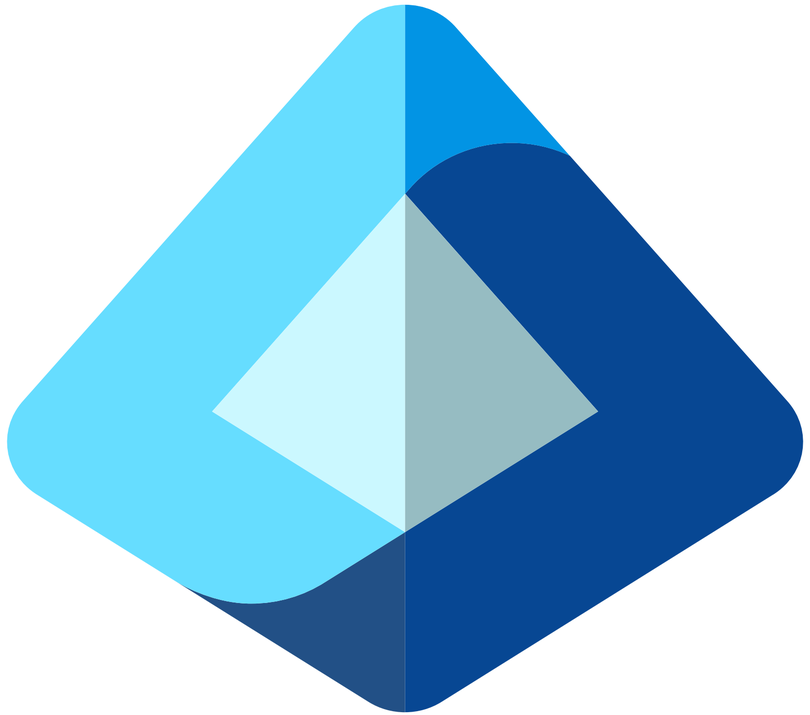
Microsoft Entra Conditional Access



- Set requirement for multifactor OR
- Set requirement for non-phishable multifactor

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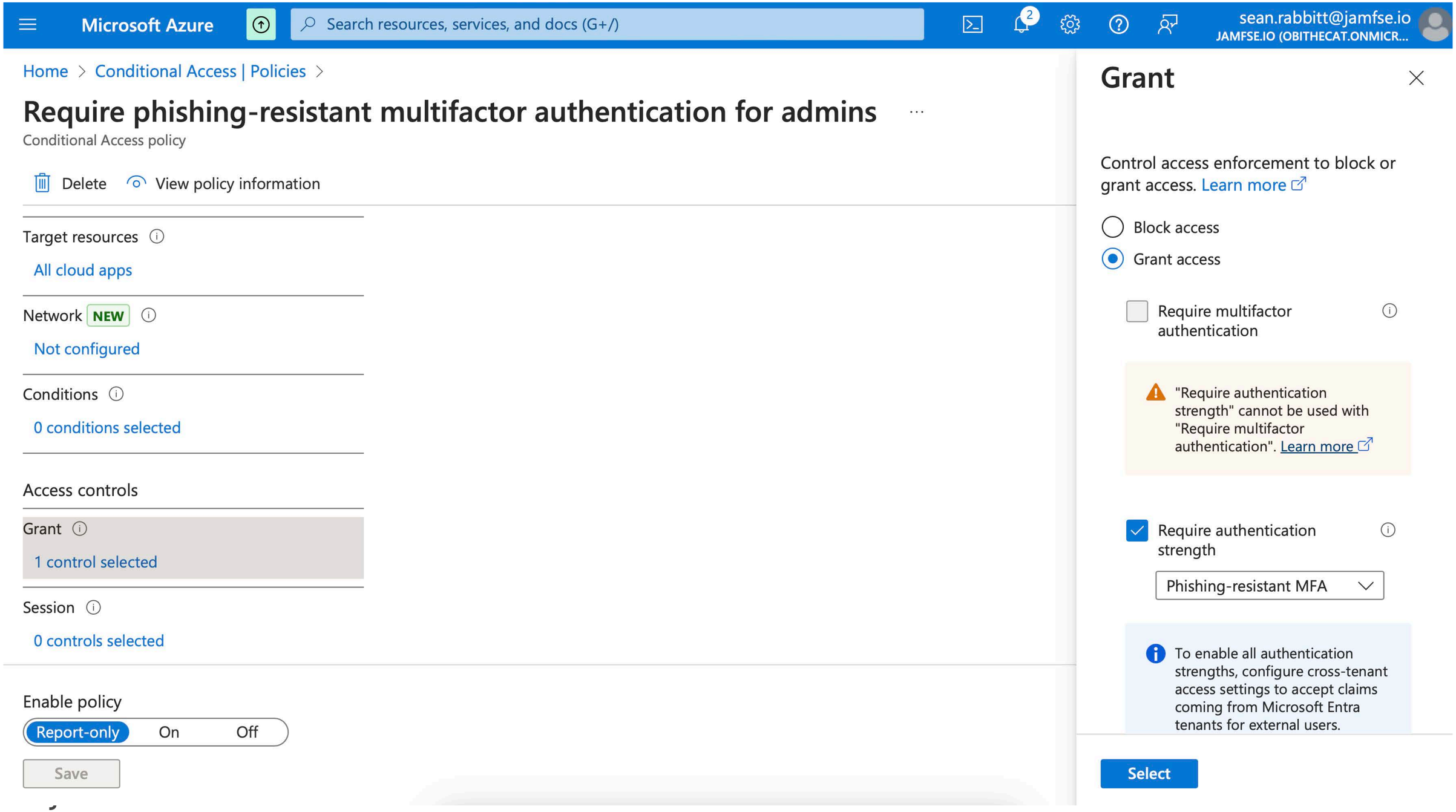
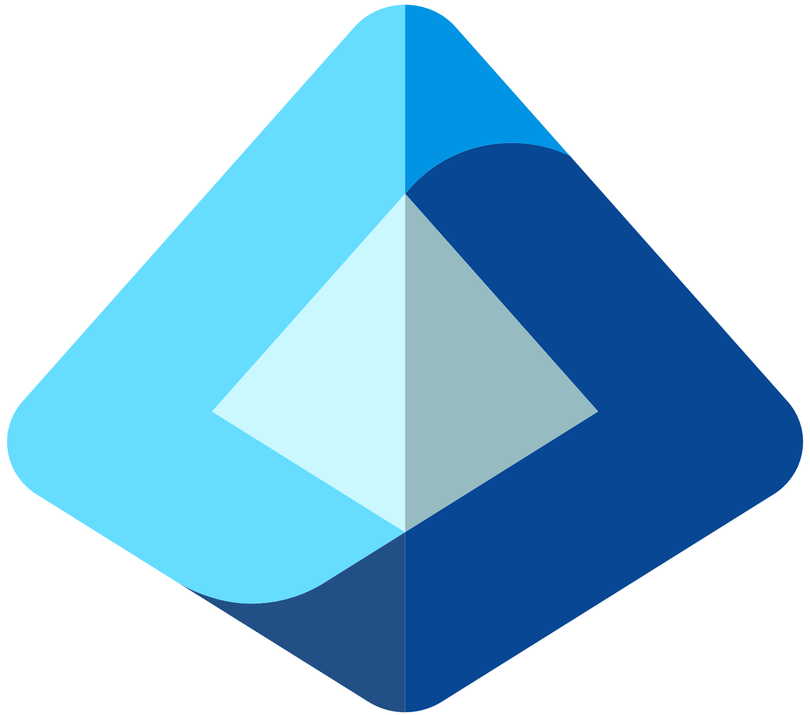
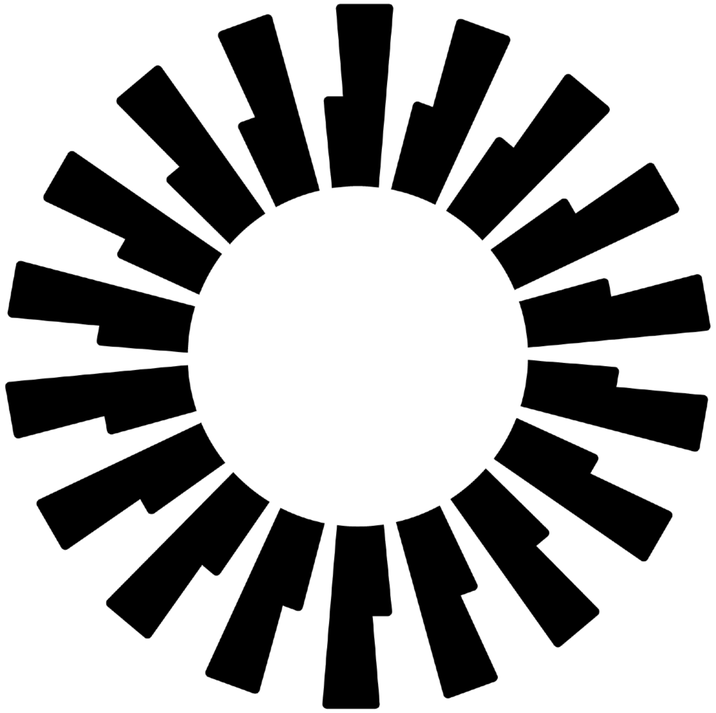

Microsoft Azure
Search resources, services, and docs (G+/)
sean.rabbitt@jamfse.io
JAMFSE.IO (OBITHECAT.ONMICR...
Home > Conditional Access | Policies >
Require phishing-resistant multifactor authentication for admins
Conditional Access policy
Delete
View policy information
Target resources
All cloud apps
Network NEW
Not configured
Conditions
0 conditions selected
Access controls
Grant
1 control selected
Session
0 controls selected
Enable policy
Report-only
On
Off
Save
Grant
Control access enforcement to block or grant access. Learn more
Block access
Grant access
Require multifactor authentication
"Require authentication strength" cannot be used with "Require multifactor authentication". Learn more
Require authentication strength
Phishing-resistant MFA
To enable all authentication strengths, configure cross-tenant access settings to accept claims coming from Microsoft Entra tenants for external users.
Select

Microsoft Entra - Issues



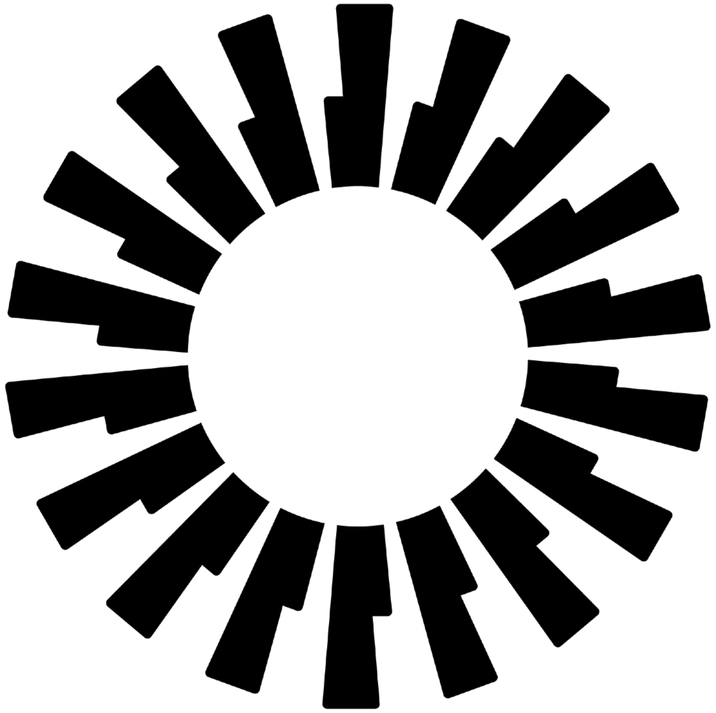
- "All cloud apps" may apply to unexpected resources and logins
- Additional devices needed for MFA
- Extensible SSOe is considered "non-phishable" method

Okta Identity Engine



- Security -> Global Session Policy
  - Establish user session with any factor used to meet requirements
  - MFA
    - Recommend set to "Not required"

Okta Identity Engine



Establish the user session with

- (•) Any factor used to meet the Authentication Policy requirements
- ( ) A password

An IdP claim will satisfy either of these options. The Authentication Policy determines the authentication requirement for a request.

Multifactor authentication (MFA) is

- (•) Not required
- ( ) Required

You can use the Authentication Policy to define multifactor requirements and characteristics of the allowed authenticators.

- Custom integrations that use the Okta Classic APIs are affected by this setting. Learn more
- Verify that multifactor authentication for your key applications is turned on. Learn more

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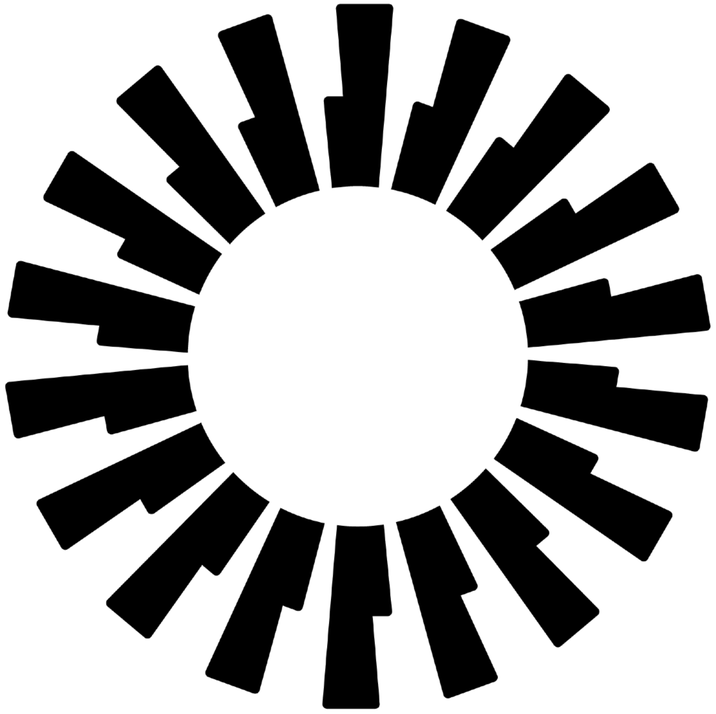
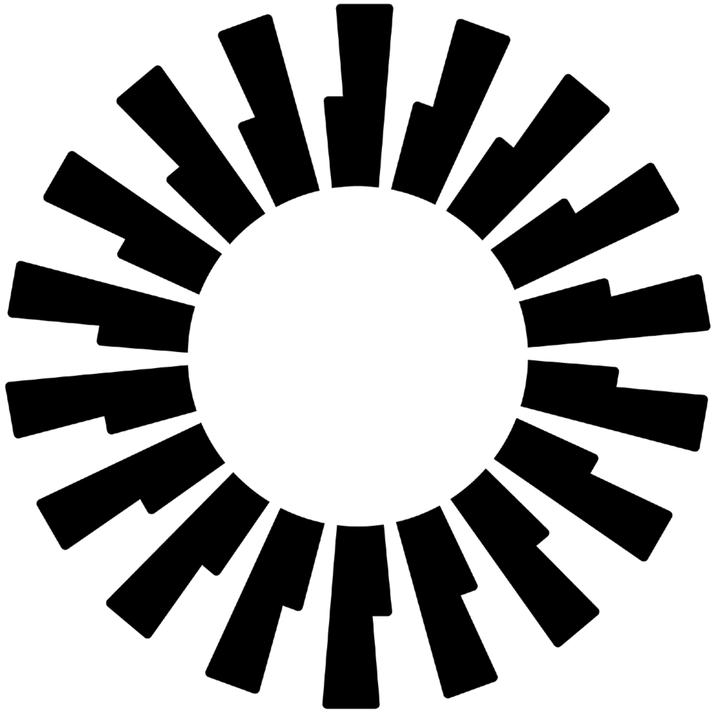
Okta Identity Engine



- Security -> Authentication policies
- User must authenticate with:
  - Any 1 factor, excluding password
  - Any 2 factors
  - Password + Another Factor
- Possession factor constraints are
  - Require user interaction
  - Require PIN or biometric verification

Okta Identity Engine



THEN

THEN Access is

- Denied
- Allowed after successful authentication

AND User must authenticate with

Any 1 factor type

AND Authentication methods

- Allow any method that can be used to meet the requirement
- Disallow specific authentication methods
- Allow specific authentication methods

Password ×

Remove

Your org's authenticators that satisfy this requirement:

1 factor type

Any TOTP Generator or Okta Verify - TOTP or Okta Verify - FastPass or Okta Verify - Push or FIDO2 (WebAuthn)

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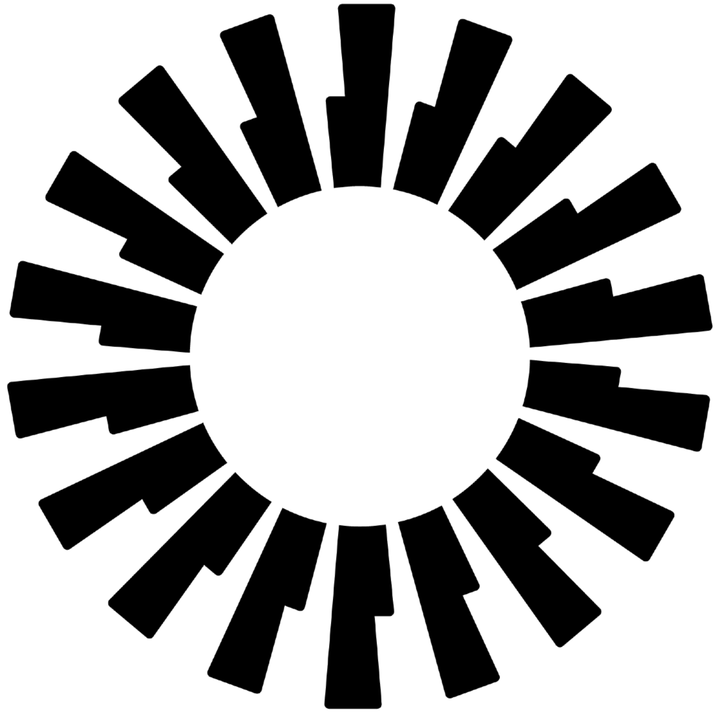

Okta Identity Engine

THEN

THEN Access is

- ○ Denied
- ◉ Allowed after successful authentication

AND User must authenticate with

Any 2 factor types

AND Possession factor constraints are

- ☐ Phishing resistant
- ☐ Hardware protected
- ☑ Require user interaction
  - ☑ Require PIN or biometric user verification

Learn more about possession factor constraints

AND Authentication methods

- ◉ Allow any method that can be used to meet the requirement
- ○ Disallow specific authentication methods
- ○ Allow specific authentication methods

Your org's authenticators that satisfy this requirement:

Knowledge / Biometric factor types

Okta Verify - FastPass[1] or Okta Verify - Push[1] or Password or FIDO2 (WebAuthn)[1]

AND

Additional factor types

Okta Verify - FastPass[1] or Okta Verify - Push[1] or FIDO2 (WebAuthn)[1]

[1] *Authenticator that may satisfy multiple factor requirements*

Your org allows users to verify their identity with a knowledge factor (Password) before the possession factor. To change this, protect against password-based attacks in Security > General

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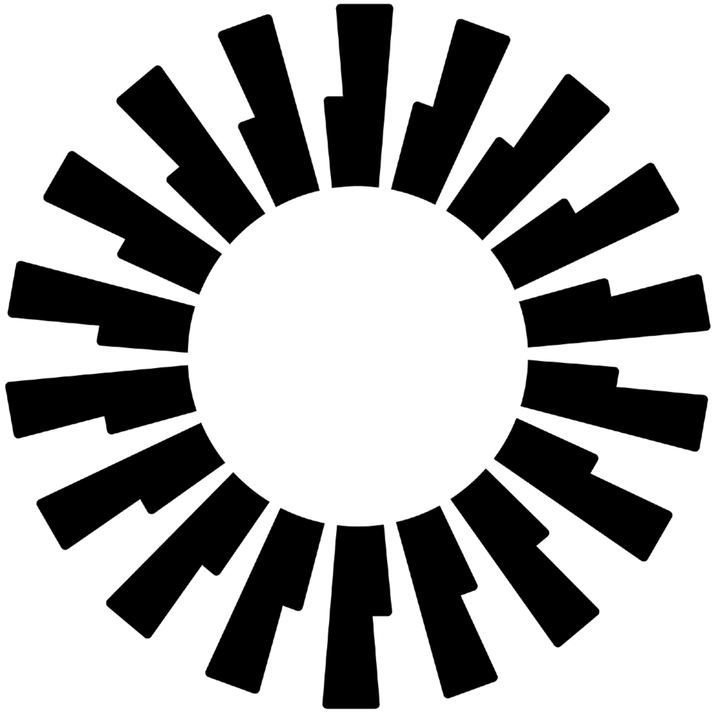
Okta Identity Engine



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- ◉ Allowed after successful authentication

AND User must authenticate with

Password + Another factor

AND Possession factor constraints are

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- ☐ Hardware protected
- ☑ Require user interaction
  - ☑ Require PIN or biometric user verification

Learn more about possession factor constraints

AND Authentication methods

- ◉ Allow any method that can be used to meet the requirement
- ○ Disallow specific authentication methods
- ○ Allow specific authentication methods

Your org's authenticators that satisfy this requirement:

Password

AND

Additional factor types

Okta Verify - FastPass[1] or Okta Verify - Push[1] or FIDO2 (WebAuthn)[1]

Your org allows users to verify their identity with a knowledge factor (Password) before the possession factor. To change this, protect against password-based attacks in Security > General

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Platform Single Sign-On

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Platform Single Sign-On
and the authentication methods that love them

Password

- Local account password kept in sync with the cloud identity provider password
- Consistent FileVault password
- Updates password at macOS login screen, wake from screen saver

SmartCard

- Tie a PIV to your cloud identity provider account
- Physical key required - setup and infrastructure to support rollout
- Use the SmartCard to unlock FileVault on Macs with Apple Silicon processors

Secure Enclave Key

- Key used to authenticate to cloud identity provider stored in hardware bound Secure Element
- Still has a local UNIX password for account and FileVault
  - Enforce complexity via MDM configuration profile
- Local auth is Touch ID + PIN/ Passcode

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Platform Single Sign-On
and the authentication methods that love them

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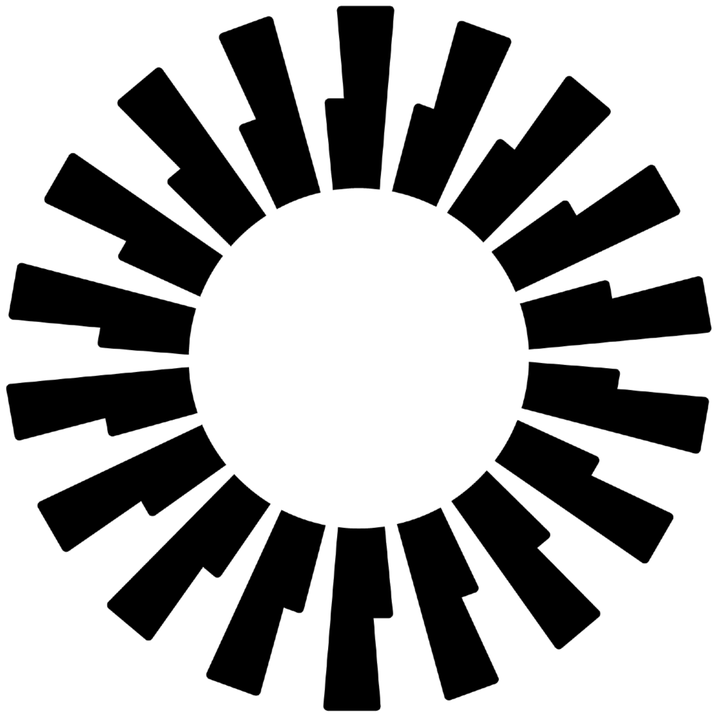
Gratuitously cribbed from Microsoft
Go to Michael and Mark's session

Microsoft Entra ID

Uses "Redirect"



Okta Identity Engine

Uses "Credential" (for SSOe)

AND uses "Redirect" (for PSSOe)

We don’t talk about betas in public forums.

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Platform Single Sign-on

To support highly secure macOS deployments that require authentication with the IdP, Platform Single Sign-on (Platform SSO) in macOS 15 is extended to:

- Require IdP authentication across FileVault, the Lock Screen, and the login window, using a new policy option, `RequireAuthentication`
- Optionally configure Touch ID or Apple Watch to unlock the screen for ease of use when `RequireAuthentication` is enabled
- Configure offline and an authentication grace period, so that users can log in or unlock the screen when they're offline

```
// Profile: com.apple.extensiblesso

<key>PlatformSSO</key>
<dict>
  <key>FileVaultPolicy</key>
  <array><string>AttemptAuthentication</string></array>
  <key>UnlockPolicy</key>
  <array>
    <string>RequireAuthentication</string>
    <string>AllowOfflineGracePeriod</string>
    <string>AllowTouchIDOrWatchForUnlock</string>
  </array>
  <key>LoginPolicy</key>
  <array/>
  <key>AuthenticationGracePeriod</key>
  <integer>604800</integer>
  <key>OfflineGracePeriod</key>
  <integer>604800</integer>
</dict>
```

Don't Panic

But do really go to Michael and Mark's session on PSSOe with Microsoft.

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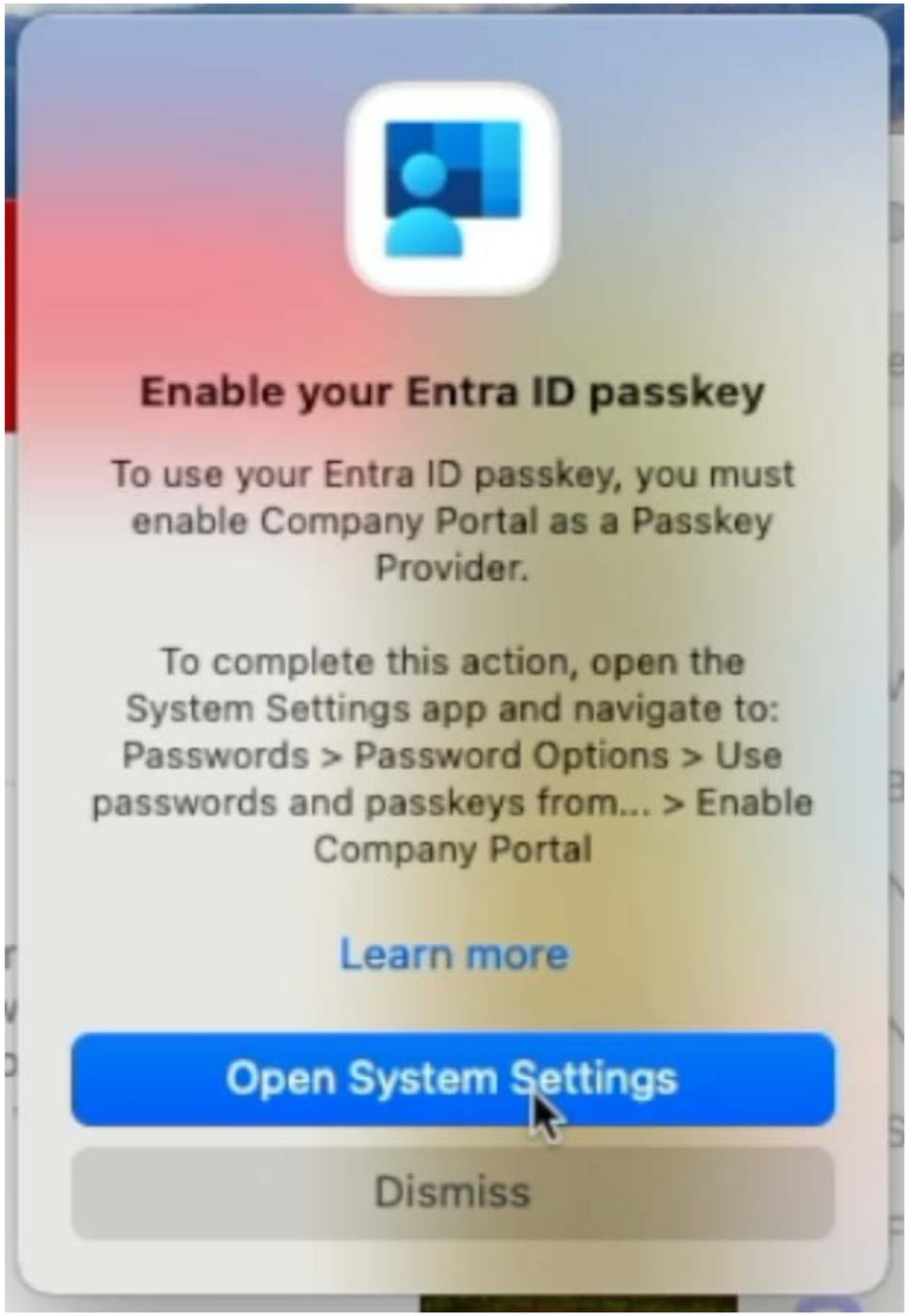
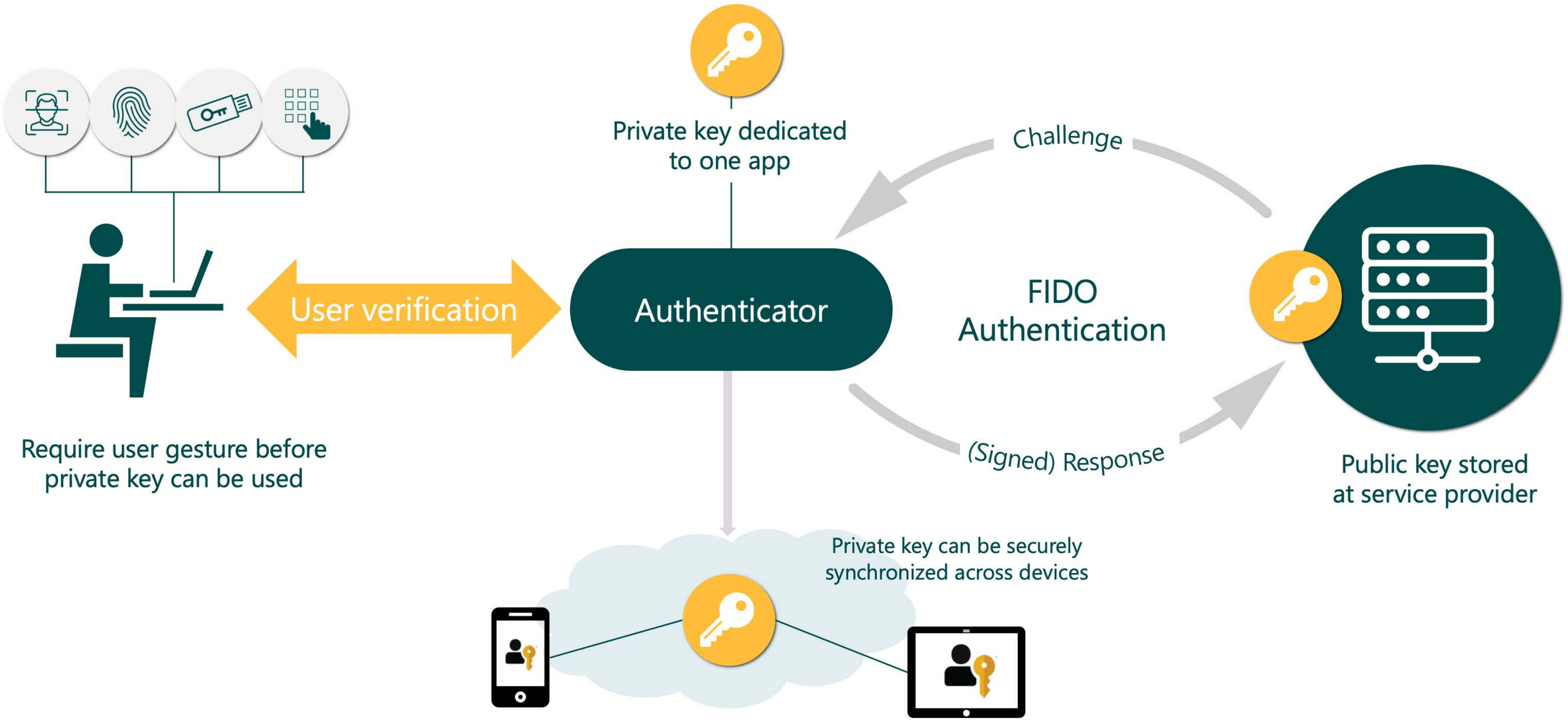

Enable your Entra ID passkey
To use your Entra ID passkey, you must enable Company Portal as a Passkey Provider.
To complete this action, open the System Settings app and navigate to: Passwords > Password Options > Use passwords and passkeys from... > Enable Company Portal
Learn more
Open System Settings
Dismiss



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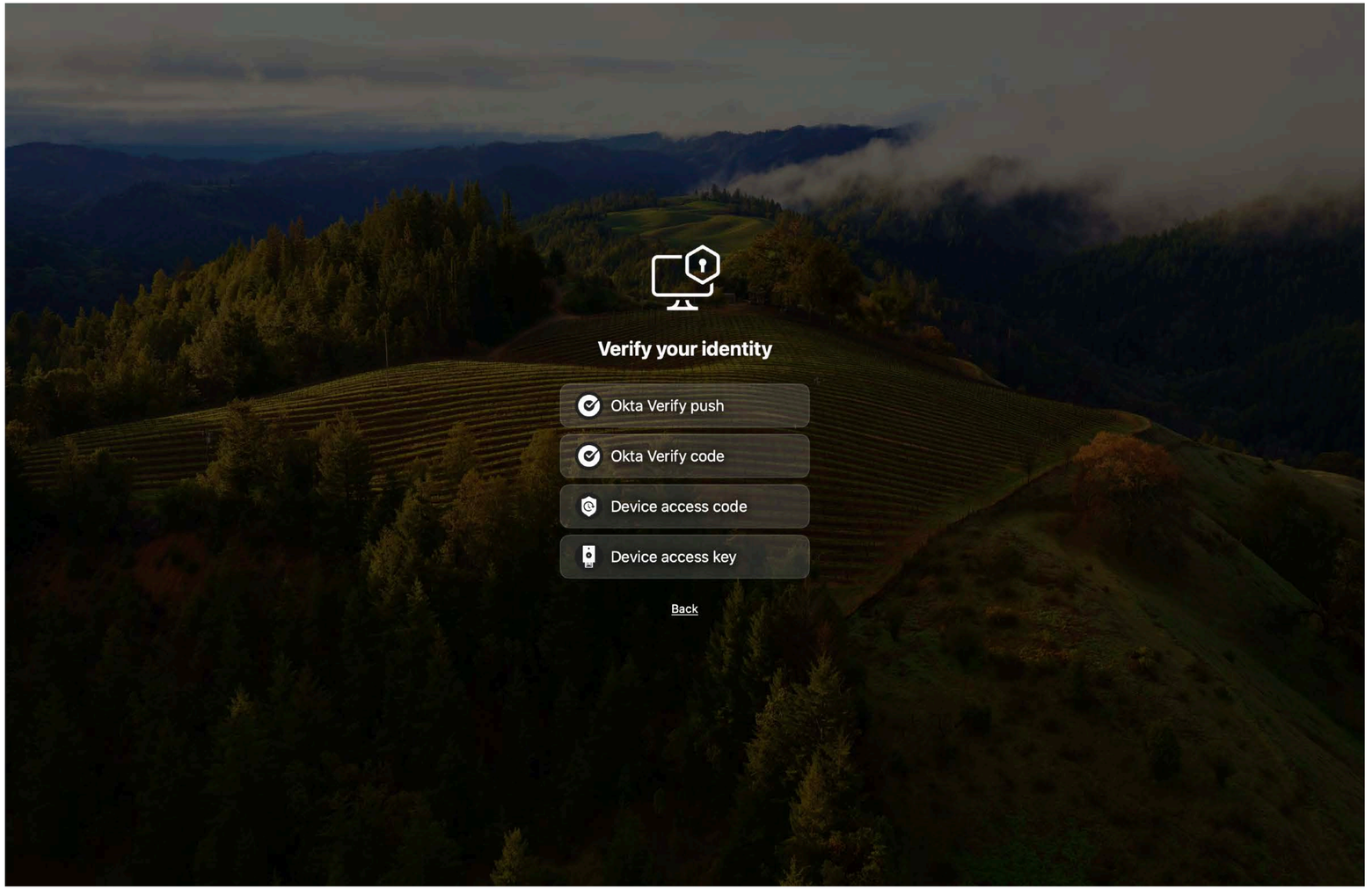
Okta Desktop MFA



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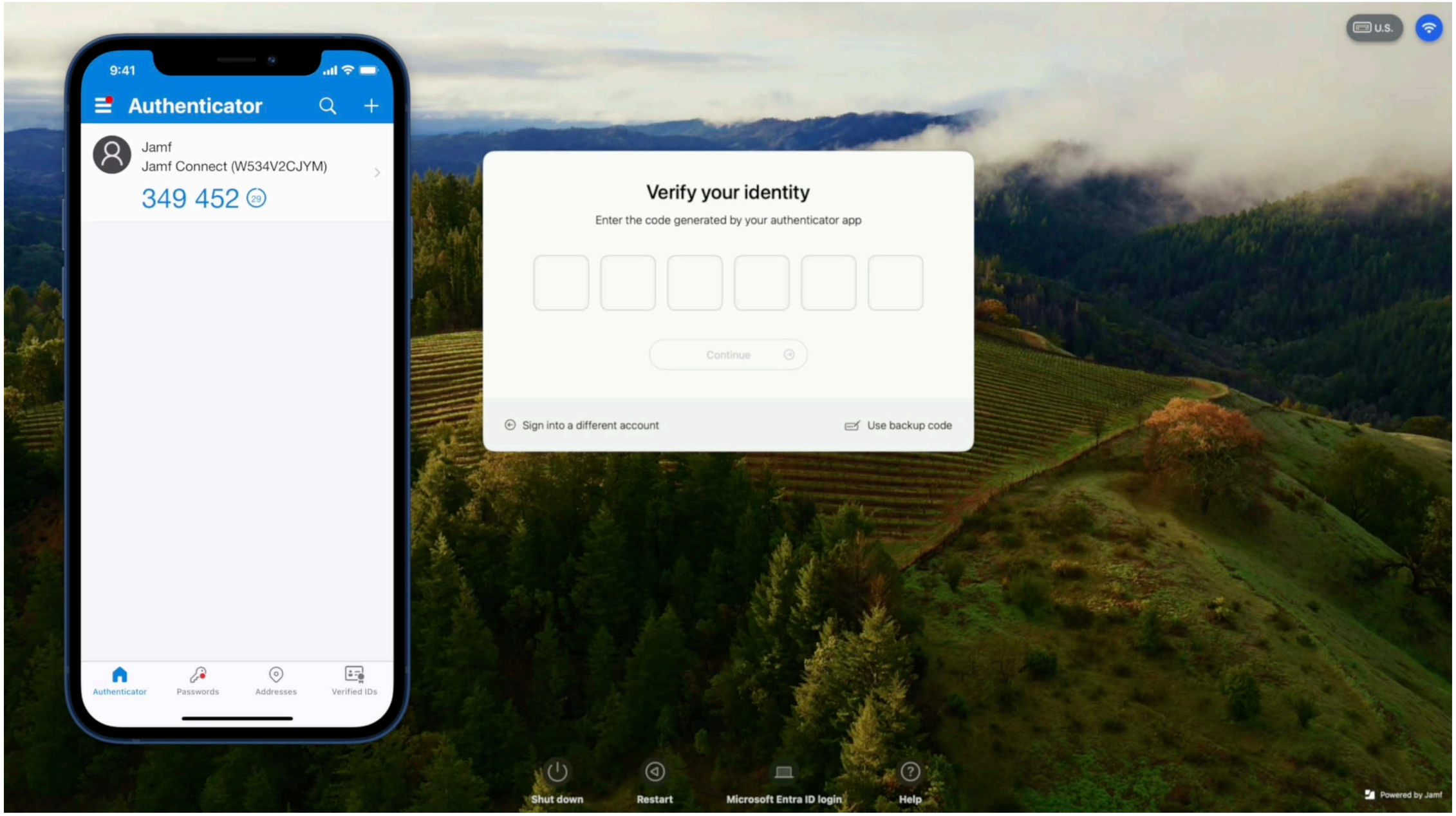
9:41
Authenticator
Jamf
Jamf Connect (W534V2CJYM)
349 452
29
Authenticator
Passwords
Addresses
Verified IDs
U.S.
Verify your identity
Enter the code generated by your authenticator app
Continue
Sign into a different account
Use backup code
Shut down
Restart
Microsoft Entra ID login
Help
Powered by Jamf

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One more thing....

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ZTNA and killing network connections

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ZTNA and killing network connections

Not valid before: 07-11-2024 09:00:00

Expires: 07-11-2024 10:45:00

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ZTNA and killing network connections

Not valid before: 07-11-2024 09:00:00

Expires: 07-11-2024 10:45:00

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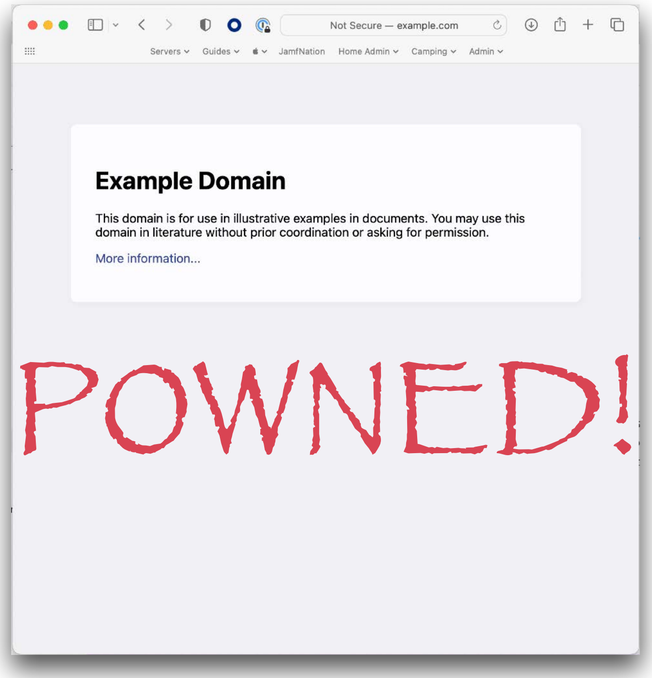
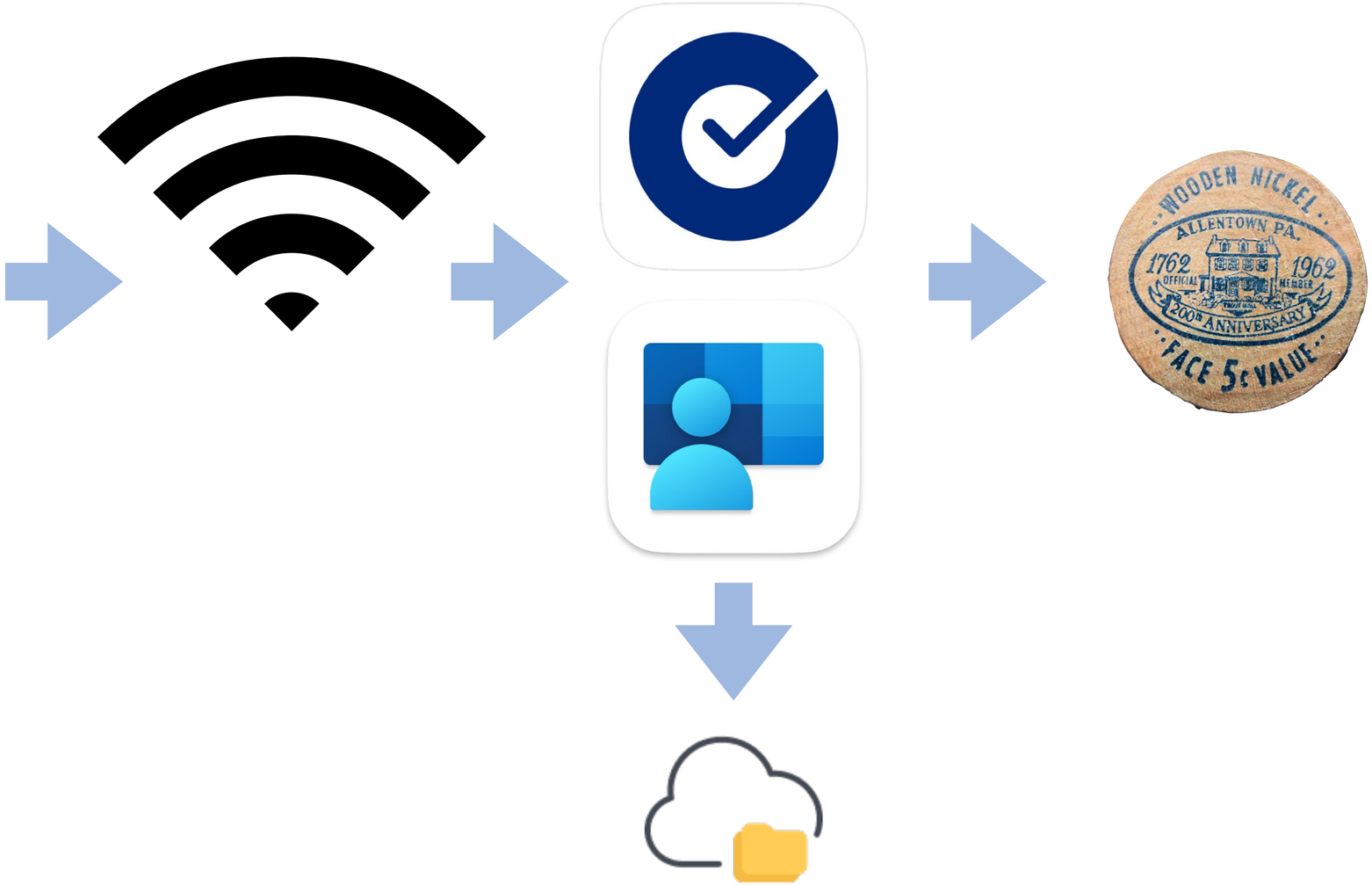
ZTNA and killing network connections



open https://example.com/login/p0wned



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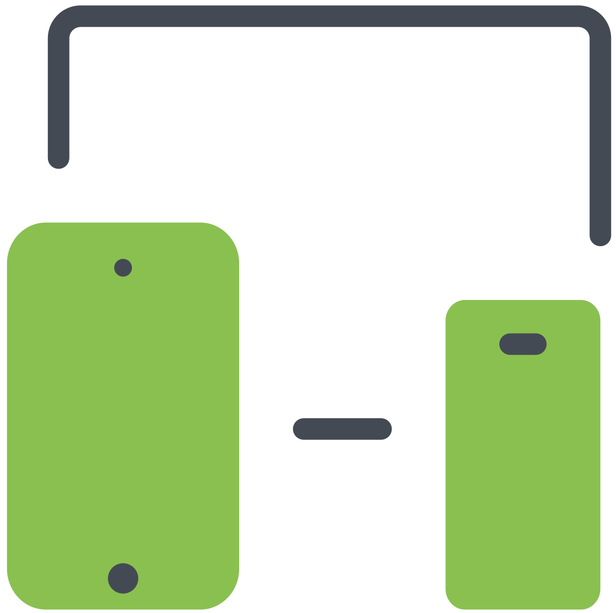
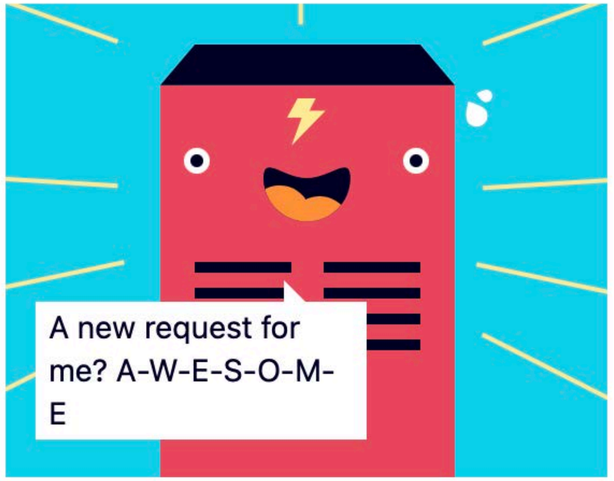
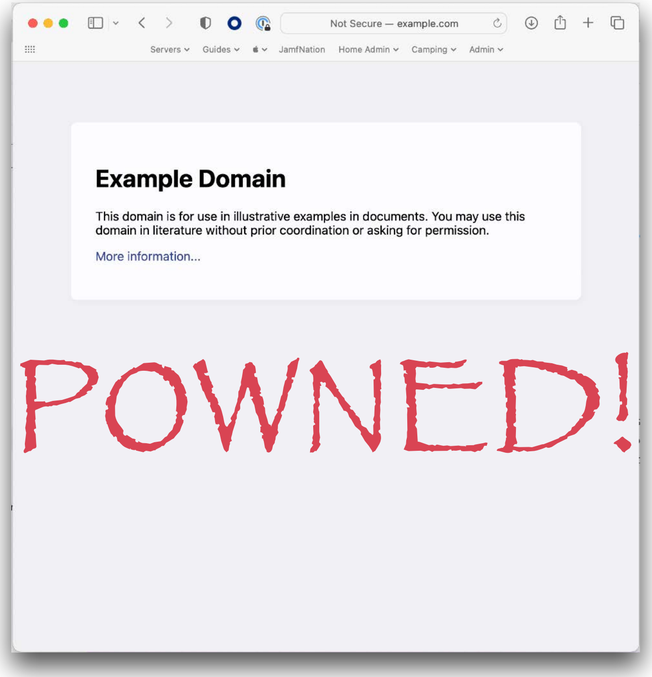
Public domain

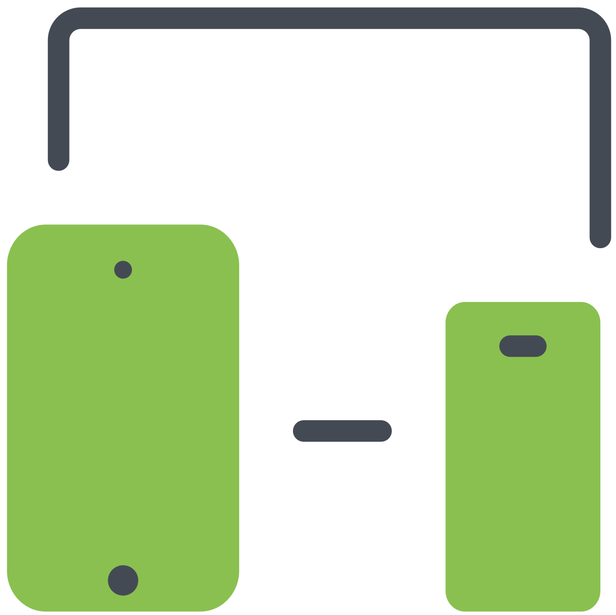
ZTNA and killing network connections





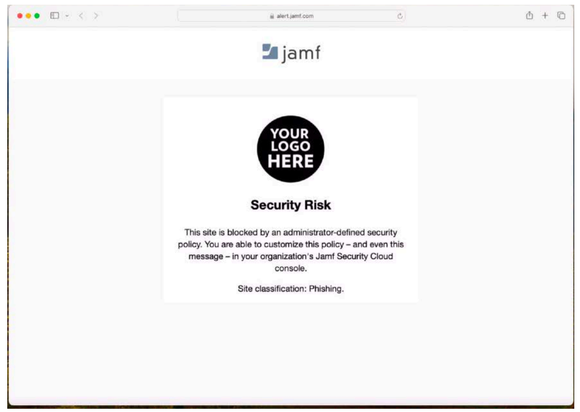


ZTNA and killing network connections



SSF Sender

"Device risk level set to HIGH"



CAEP signal receiver

Final Thoughts

And then there will be cake.

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Final Thoughts

- SSOe is a possession factor, a *single* factor
- PSSOe is a possession factor too
- If you're accessing a resource, and the device itself is the factor, protect the device.

I'd like you to give the gift... of feedback. To Apple.

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I'd  **the**
gift... c Apple.

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feedbackassistant.apple.com

Use your Apple Business Manager or Apple School Manager managed Apple Account.
Switch to "Organization" mode.

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feedbackassistant.apple.com

Use your Apple Business Manager or Apple School Manager managed Apple Account.
Switch to "Organization" mode.

"Basic authentication is no longer acceptable to decrypt our stored data at rest."

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https://github.com/sean-rabbitt
for slides

I'll be at Jamf's booth after this.

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Thank you.

Special thanks to Doug Muth (Giza) for the Dead Simple QR Code Generator
https://httpbin.dmuth.org/qrcode/

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