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Does FIDO really usher in the Death of Passwords?

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Agenda

- Introduction: Why FIDO?
- FIDO Architecture, Security & Privacy
- FIDO Adoption Challenges
- Summary and Recommendations

Disclaimer

* The views expressed here are our own and not necessarily those of our company or FIDO Alliance

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Why Fast IDentity Online?

fido™ alliance

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Password Problems

TOO MANY TO REMEMBER, DIFFICULT TO TYPE, AND TOO VULNERABLE

RE-USED

PHISHED

KEYLOGGED

Today's Solution

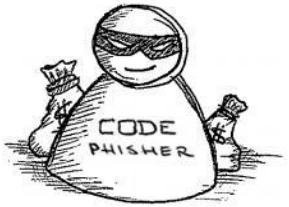
One Time Codes (SMS or Device)

IMPROVE SECURITY BUT AREN'T EASY ENOUGH

DEVICE COST

SMS USABILITY

PROVISIONING



STILL PHISHABLE

FIDO Solution

- Second Factor Experience
- Passwordless Experience

Second Factor Experience

ONLINE AUTH REQUEST

Login ID & Password

LOCAL DEVICE AUTH

Insert Dongle & Press button

SUCCESS

Done

Passwordless Experience

ONLINE AUTH REQUEST

Transaction Detail

LOCAL DEVICE AUTH

Show a Biometric

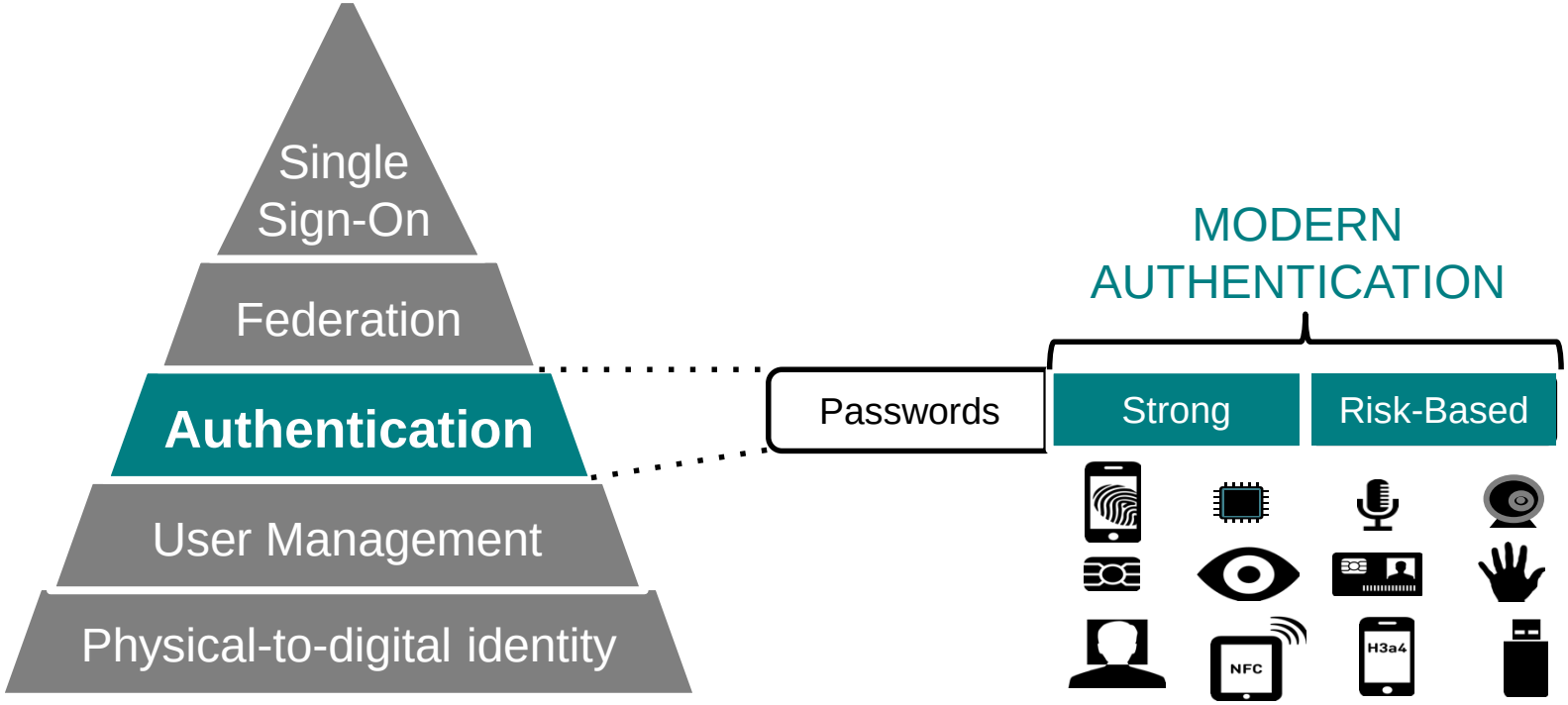
SUCCESS

Done

FIDO Primary Goals

- Standardize strong multi-factor authentication
- Preserve end-user privacy
- Unify end-user experience

FIDO in Identity & Access Management (IAM)



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FIDO Architecture, Security and Privacy

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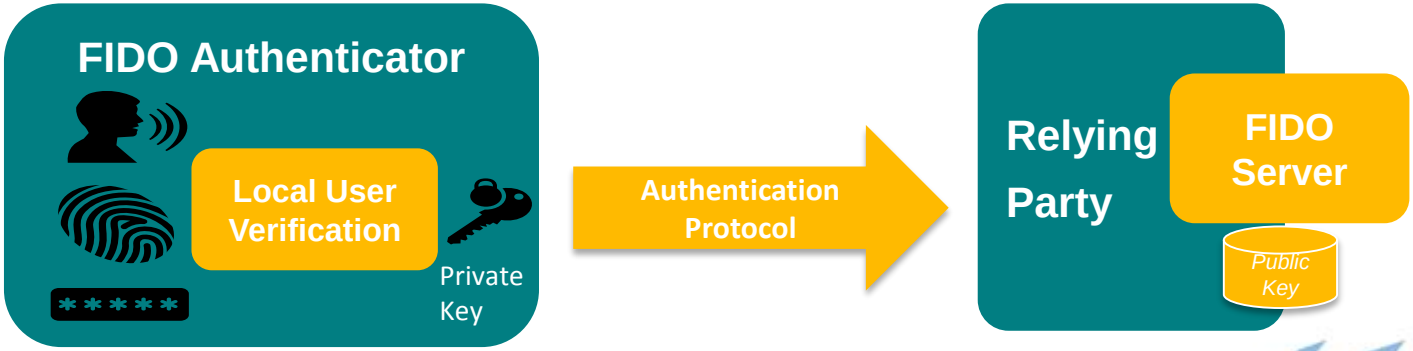
FIDO Authentication Frameworks

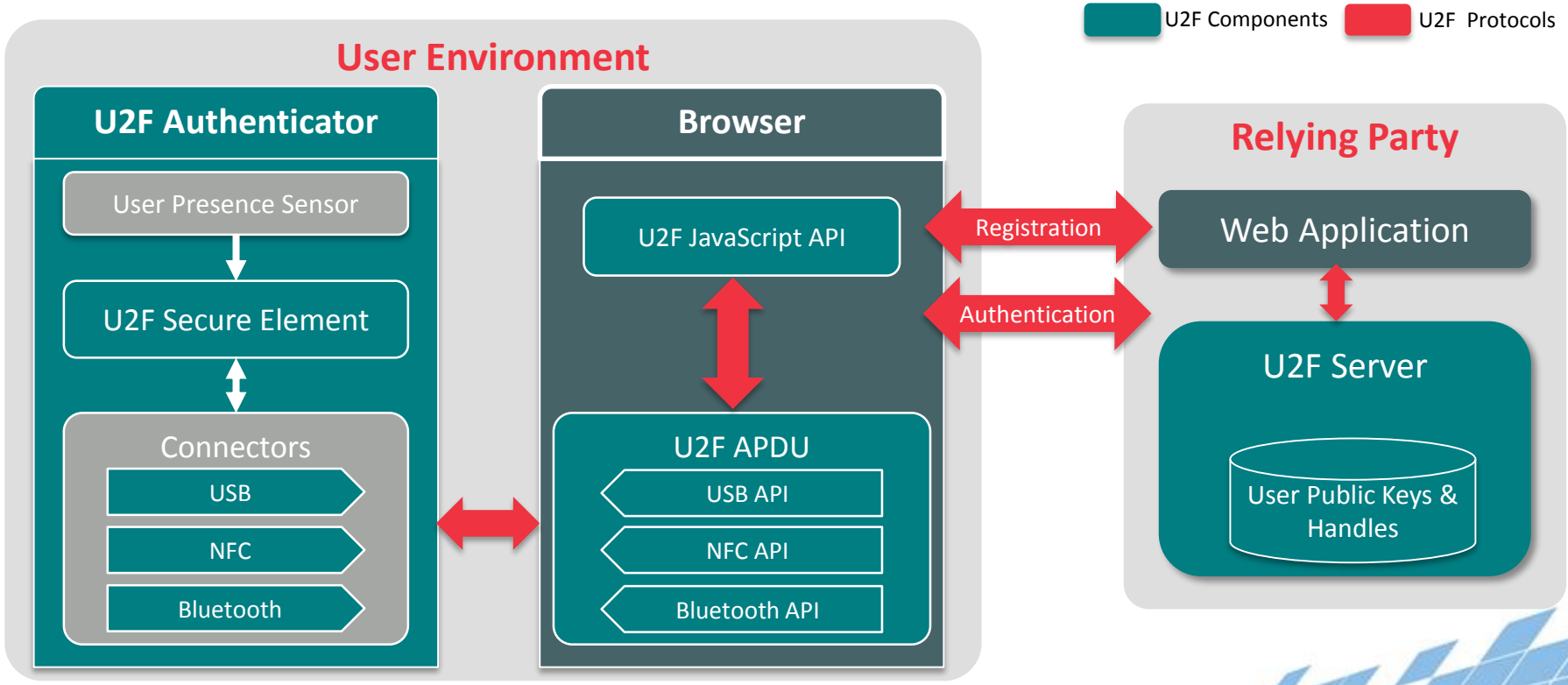
- FIDO 1.0
  - Universal Second Factor (U2F) → Second Factor Experience
  - Universal Authentication Framework (UAF) → Passwordless Experience
  - Specs available to the public
- FIDO 2.0
  - Second Factor and Passwordless Experiences
  - New technical working group
  - Mission: Future requirements and widespread interoperability

Common Design Considerations

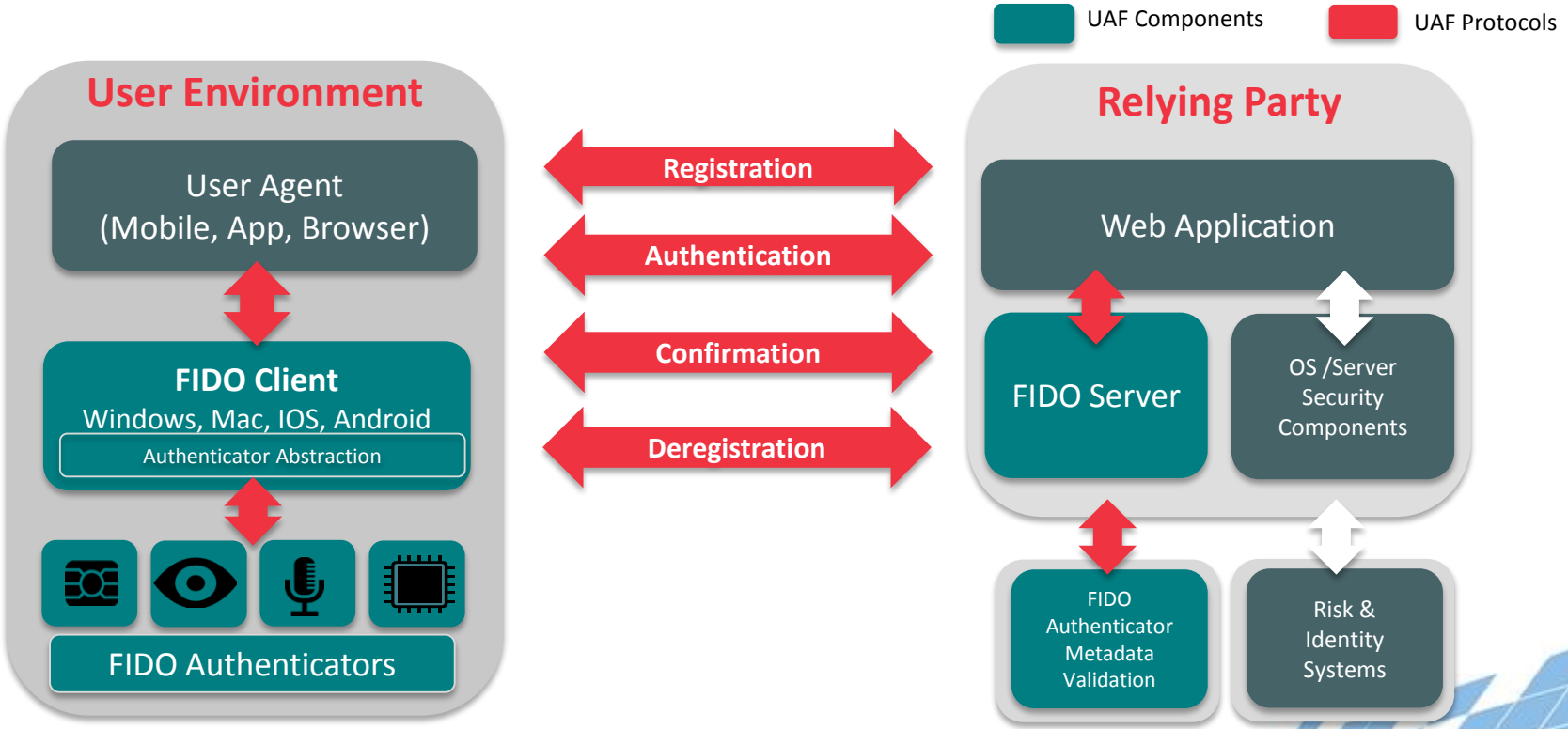
- Decouple **User Verification** from **Authentication Protocol**
- Use Asymmetric Key Cryptography
- Accept Different Kinds of Authenticators



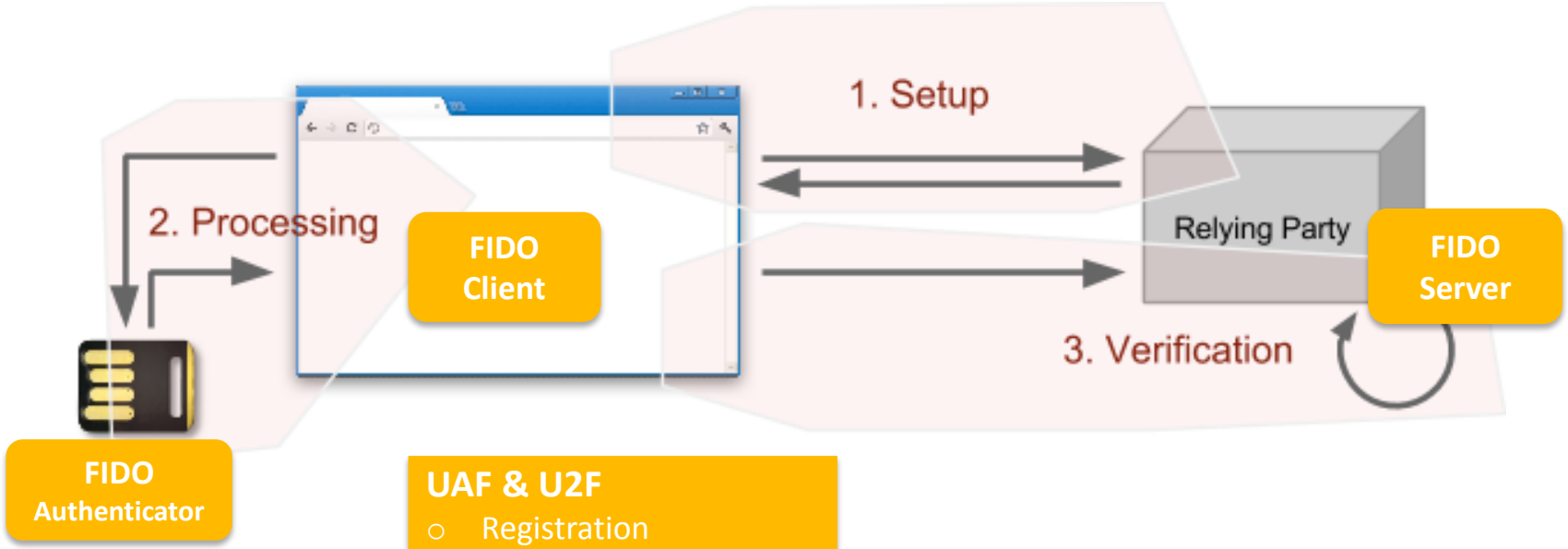
FIDO U2F Components and Protocols



FIDO UAF Components an Protocols



FIDO Protocol Flows



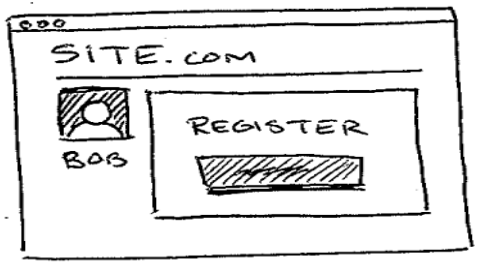
UAF & U2F
- Registration
- Authentication

UAF-only
- Transaction Confirmation
- Deregistration*

FIDO Registration

1

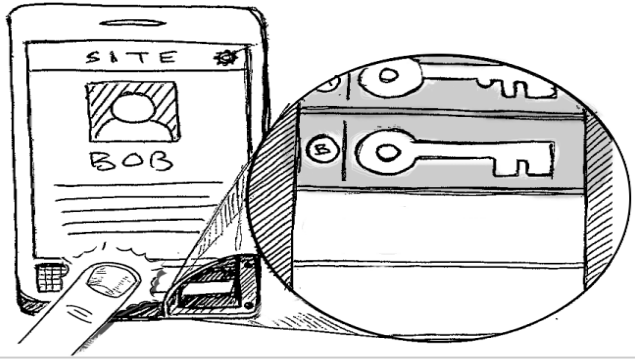
REGISTRATION BEGINS



USER APPROVAL

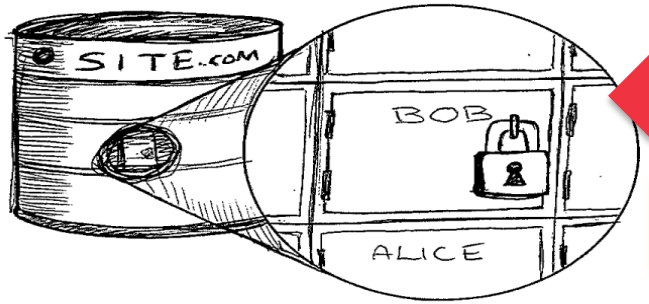
USER APPROVAL

2



4

REGISTRATION COMPLETE

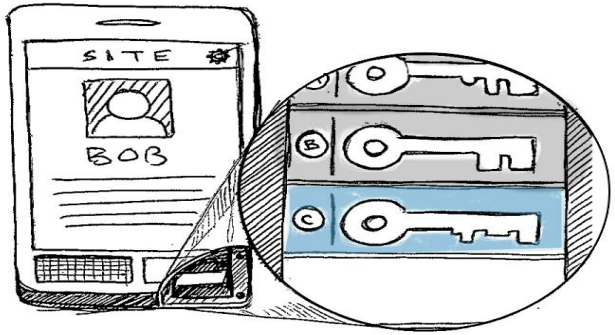


PUBLIC KEY REGISTERED

Using Public key Cryptography

NEW KEY PAIR CREATED

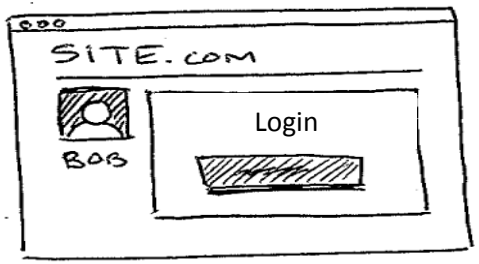
3



FIDO Login

1

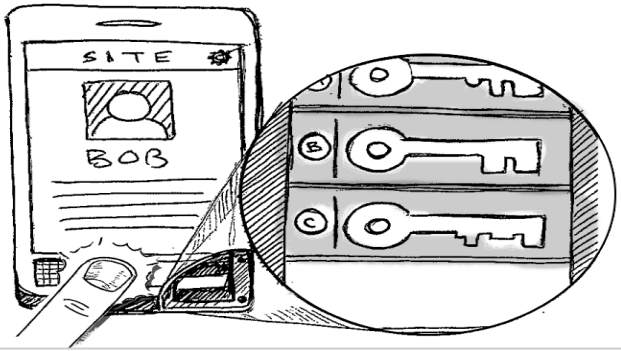
LOGIN



LOGIN CHALLENGE

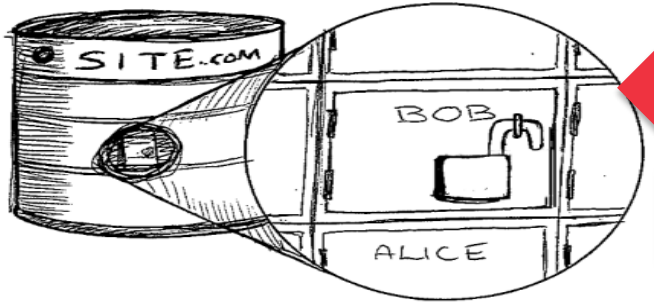
USER APPROVAL/VERIFICATION

2



4

LOGIN COMPLETE

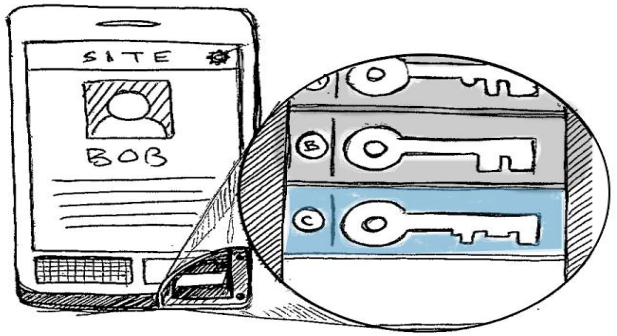


LOGIN RESPONSE

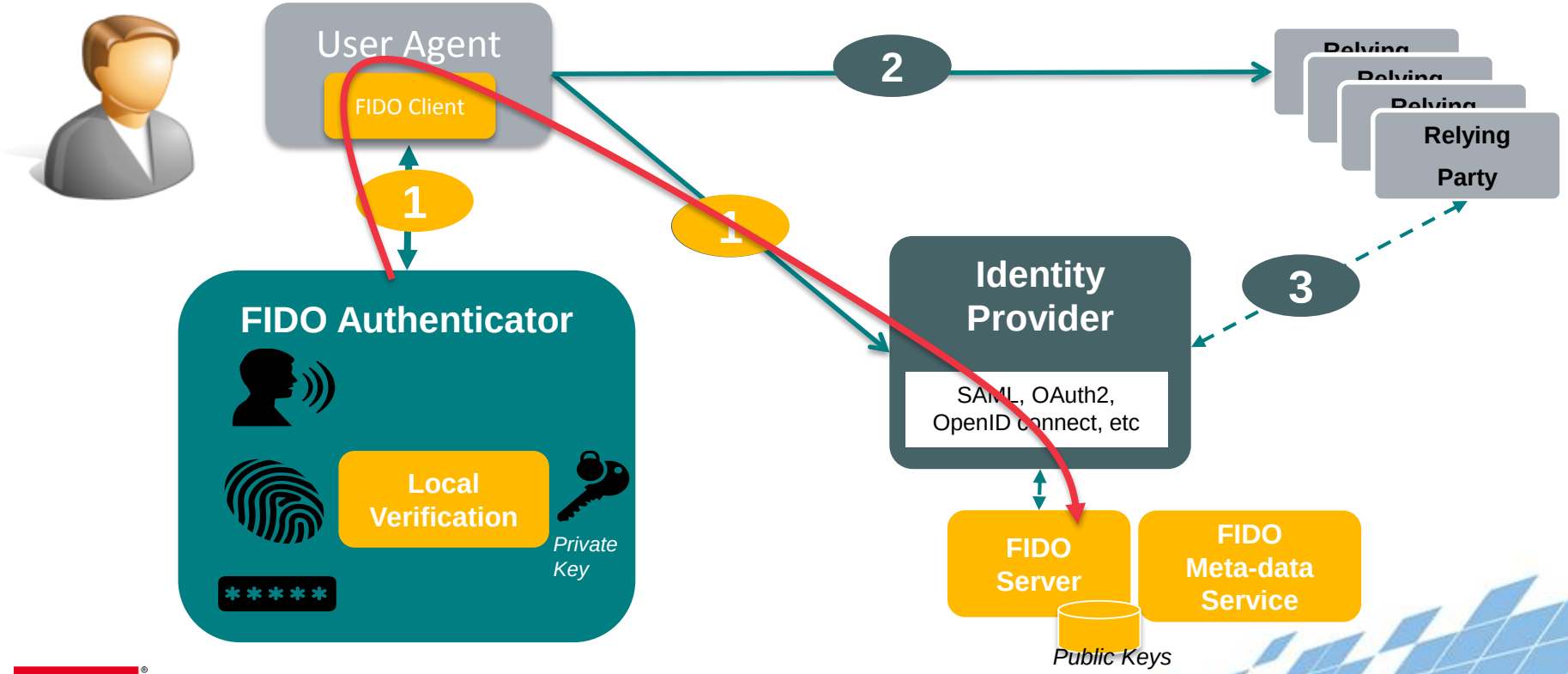
Using Public key Cryptography

KEY SELECTED

3



FIDO as part of a complete IAM solution



Security

- No Phishing
- No Man-In-The-Middle (MITM)
- No Secrets/Private Keys on Server

Privacy

- No link-ability
  - Relying party and account specific-keys
  - No unique ID per-device
- No Biometric data on server
- User Consent/Approval for all actions

Trust

- Verify Device Vendor
- Verify Device Security Characteristics
  - User Verification Methods
  - Key Protection Methods
  - Display Capabilities
  - Cryptography Algorithms, etc.
- Device certification program

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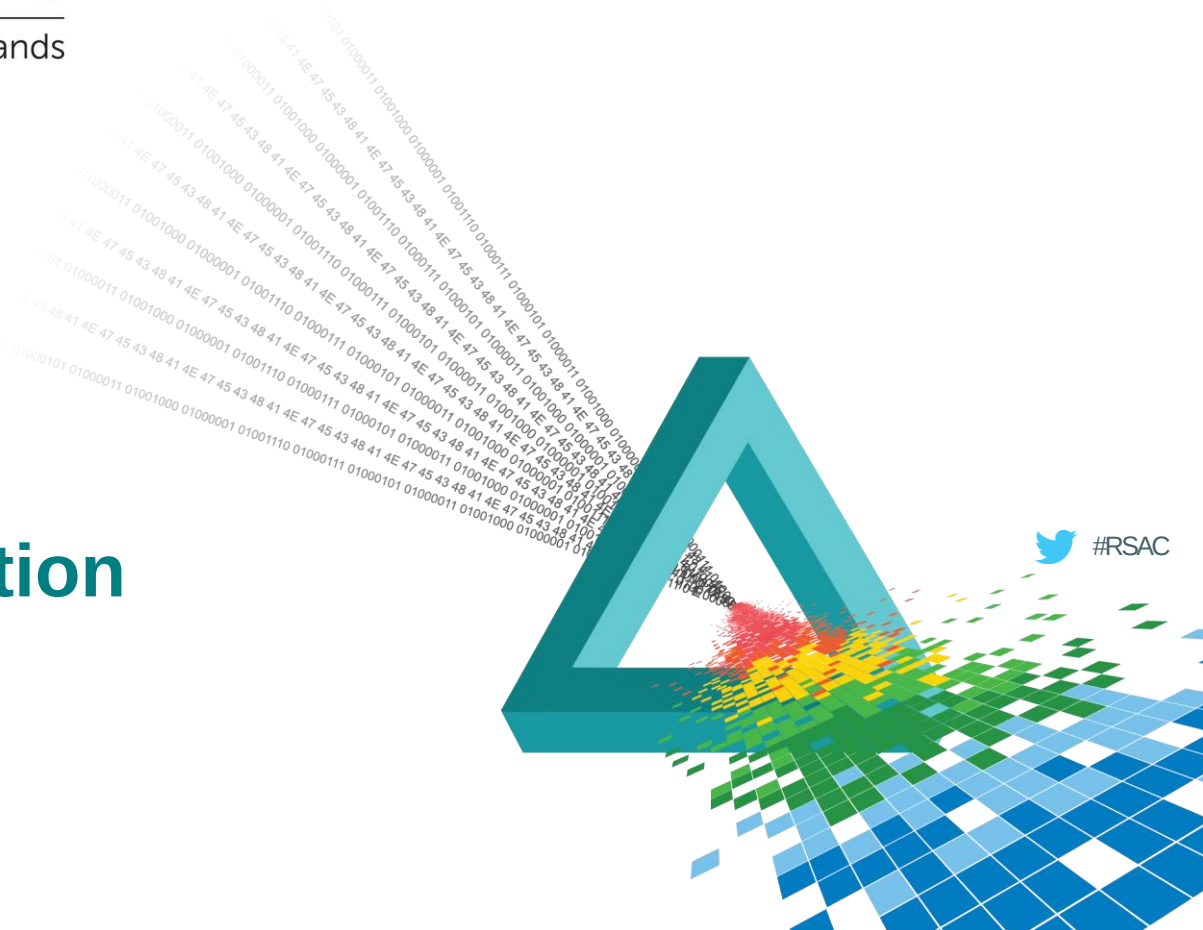
FIDO Implementation Challenges



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Interoperability

- UAF and U2F
- Further potential fragmentation with FIDO 2.0

New Infrastructure Investments

- Invest in new FIDO servers & (optional) Metadata services
- Changes to your web/mobile applications
  - Enrollment & Login workflow
  - Dependency on OS, Browser and device types/versions
- Last mile: Integrate with existing security IAM infrastructure
- Different laws and regulations in different regions

Enterprise Adoption Challenges

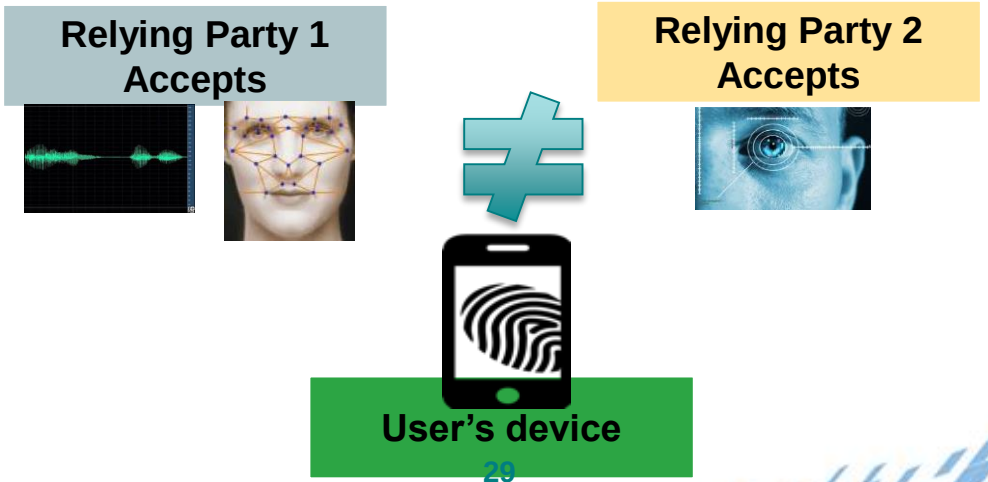
- Change tied to IT ‘refresh’ cycles (2-4 years) for such solutions
  - Look for similar adoption cycles within the enterprise
- Support integration with enterprise security IAM infrastructure
  - Authorization & Federation services
  - Blend-in as part of existing multi-factor framework/as part of assurance policies
  - User, Device and Application Provisioning & Management process
  - Integrate with IWA (Active Directory, existing identity stores)

Security threats

- Many things are **out of scope for FIDO** but important to your infrastructure security
  - Primary authentication (threat to Client, Server & RP)
  - Recovery (threat to RP)
  - Private Key protection (threat to Client)
  - Credential/Biometric data protection (threat to Client)
  - FIDO biometric authenticator “Strength”

User experience

- New experience: Registration, verification and recovery processes
- Necklace problem still exists
  - Various RPs may restrict support for specific authenticators
    - Fragmentation, Various Acceptance Criteria & Assurance levels



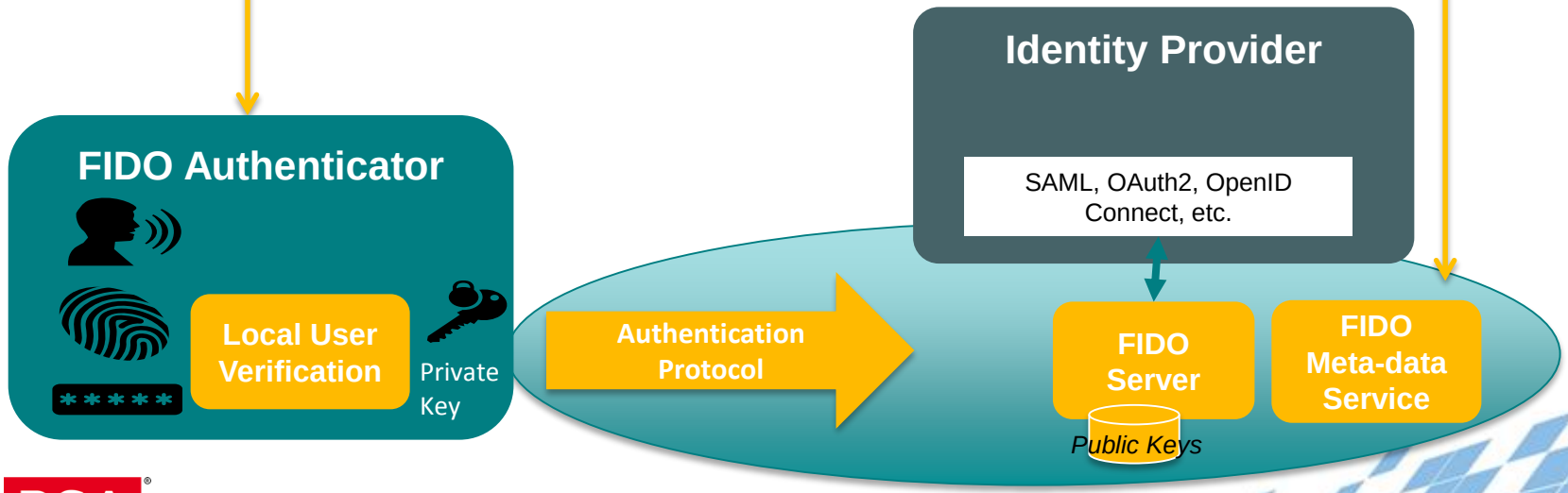
Customer Support

- Help desk retraining
- Authenticators life-cycle management issues
- Expected increase in support calls
- Evaluate authenticators assurance levels (e.g. biometrics)
- Multi-authenticator support calls
  - Authenticators can not be uniquely identified (by-design)
  - How to decommission a specific authenticator

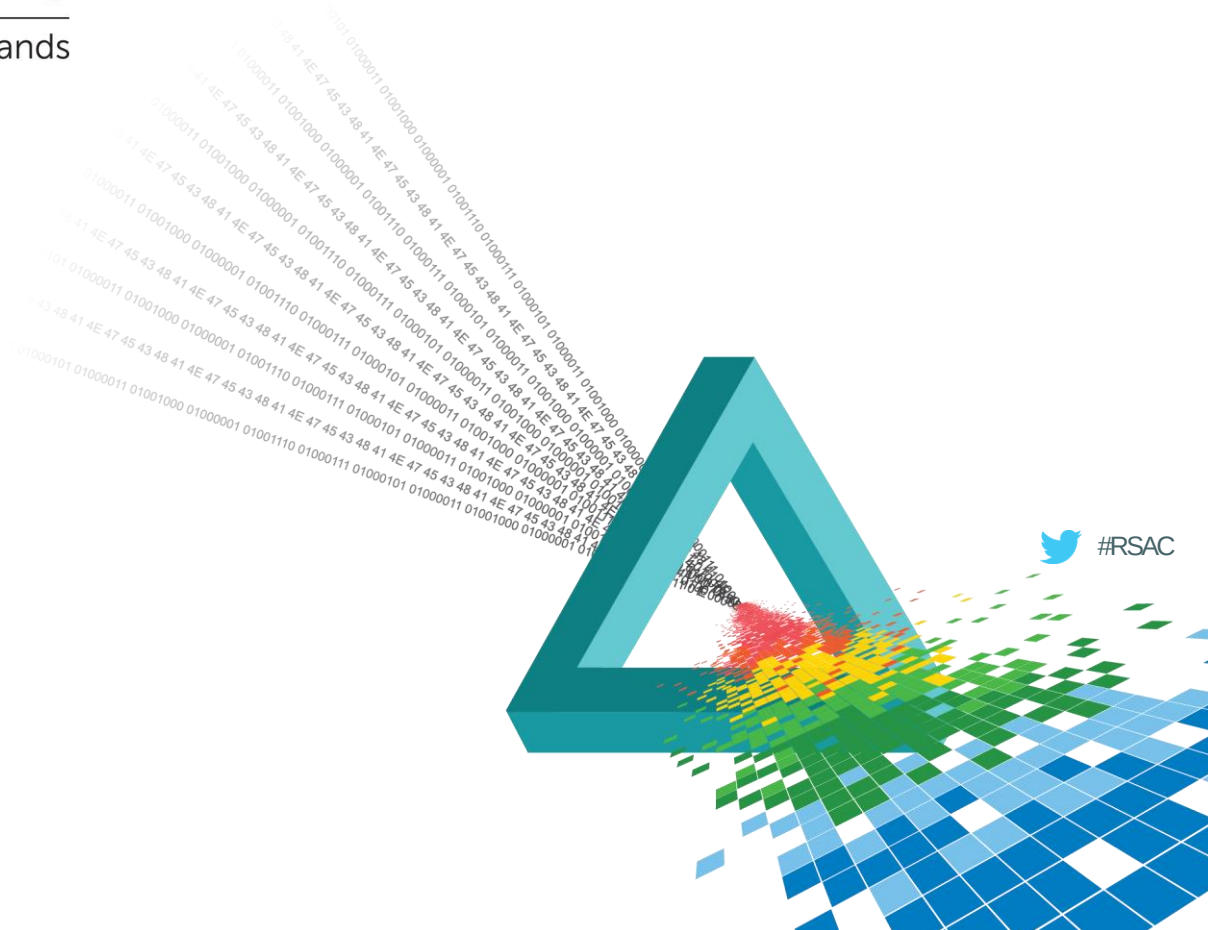
Added Cost

User: Smartphone/tablet should be FIDO-equipped/certified

RP / Enterprise: Add FIDO server, Metadata server, and integration into existing IAM



Summary



We're not there 'yet'

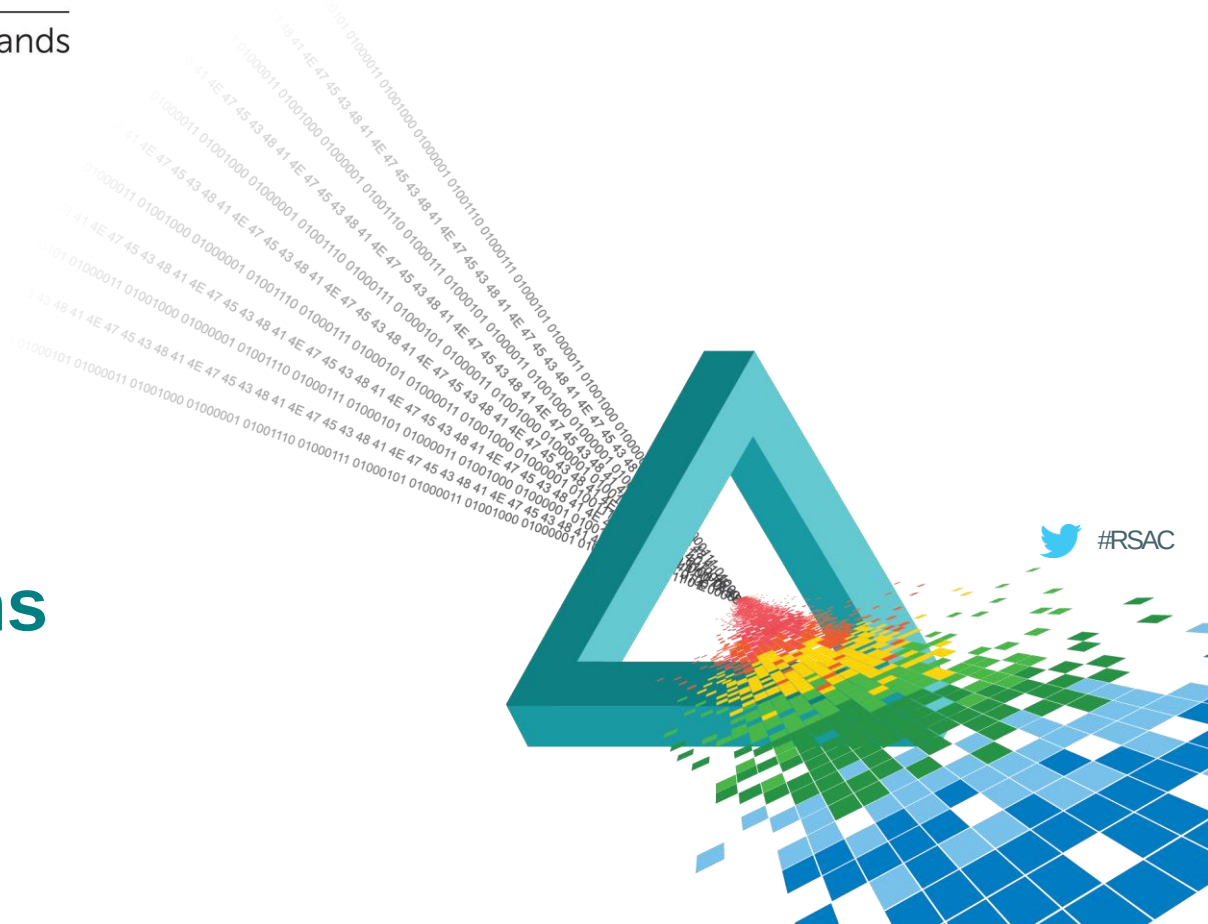
- Utopia
  - Devices: All have well designed, easy to use FIDO authenticators
  - Enterprise: All apps support FIDO authentication
  - Hackers: Leave device-side biometric authentication "alone"

- Reality (for the next ~3-5 years)
  - Devices: Growing mix of different capabilities, makes & models
  - Enterprise: Hodgepodge of Auth protocols and standards
  - Hackers: Can't wait…

There's some convincing to do…

- Adoption
  - As more companies deploy FIDO enabled solutions with positive feedback: Deployment & Usage
- Security
  - Assurance: As FIDO authenticators provide meta-data to clearly 'grade' each authenticator's Assurance Level
- Certification
  - Rely on FIDO certification of larger number of authentication vendors

Recommendations



Recommendations for FIDO-aware solutions

- Take close attention to FIDO technical working groups
- Don’t put all your eggs in one basket, throw a wider net
  - Design around solutions that take advantage of the **evolving** mobile auth methods
  - **Avoid** solely relying on a single
    - FIDO Factor/Method
    - FIDO supported Platform/OS
  - Look for broad support and compliance
- Determine Risk
  - Take advantage of solutions that include “**User behavioral data**” to make better decisions
    - User location, network, device registration, usage and activity pattern

Recommendations for FIDO-aware solutions

- Survey your users with simple PoCs to see what FIDO method ‘works’ for them
- Remember: Combining auth methods **lowers** the risk of each method:
  - Improves chance of information being accessed by the right person
- It’s a Balancing Act
  - Blend FIDO with other auth methods based on user “role” & “action

Questions?