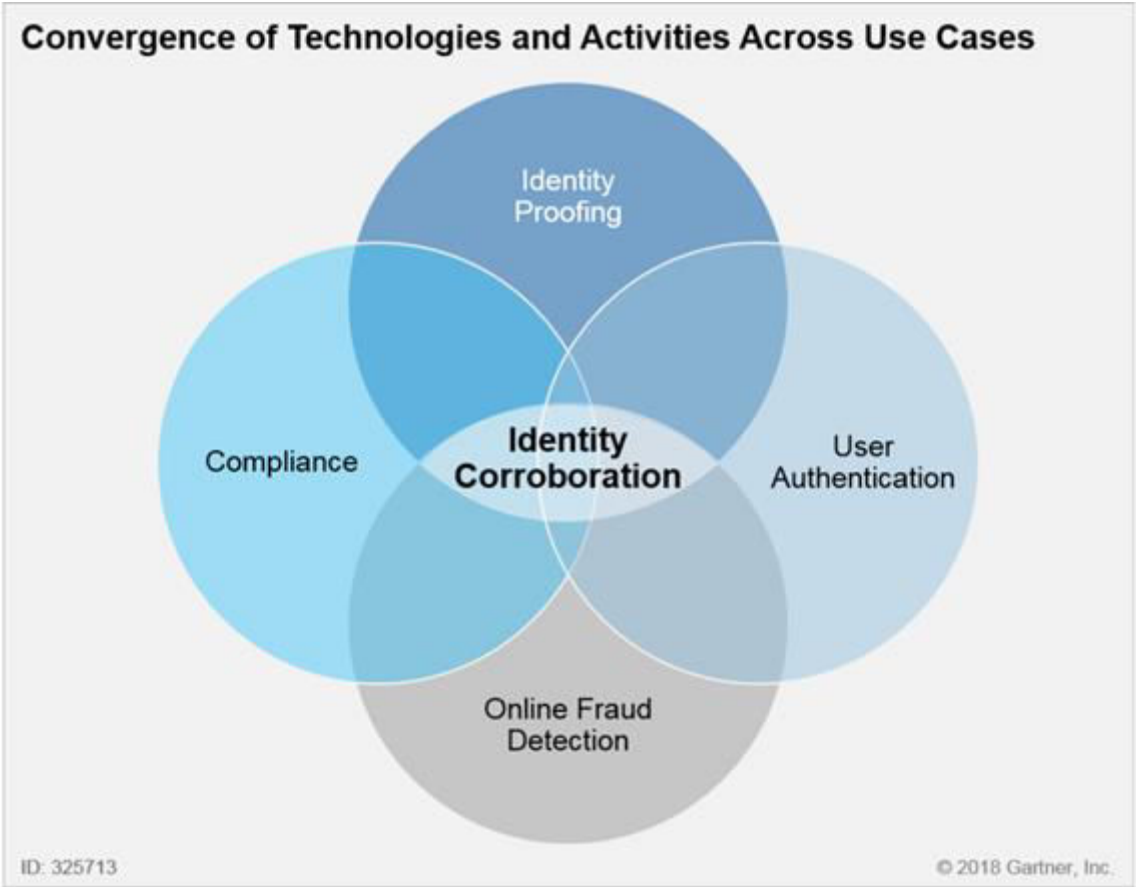
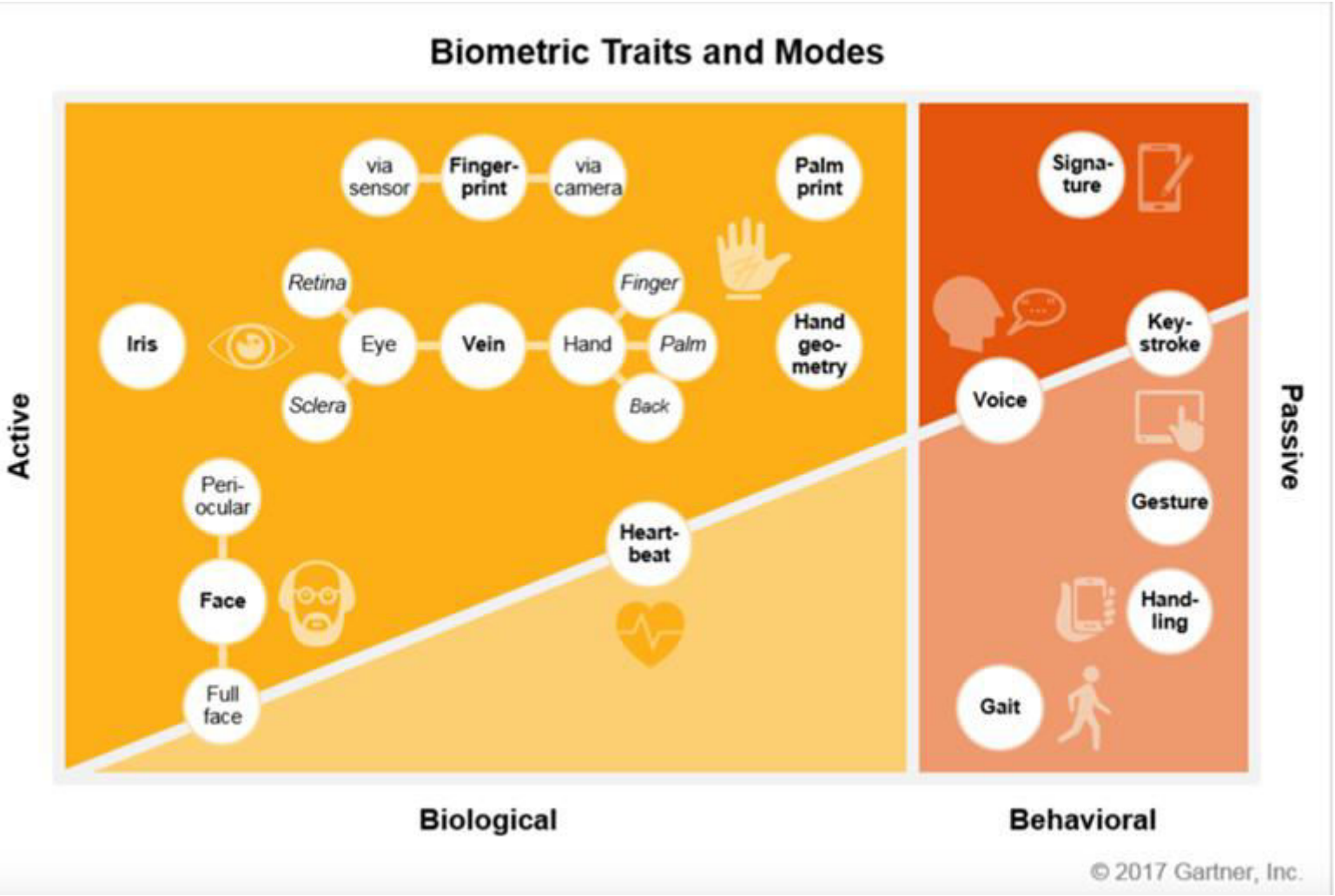

# Authenticators

# Convergence




Biometric Traits and Modes
Active
Passive
Biological
Behavioral
via sensor
Finger-print
via camera
Palm print
Retina
Finger
Iris
Eye
Vein
Hand
Palm
Hand geo-metry
Sclera
Back
Peri-ocular
Face
Full face
Heart-beat
Signa-ture
Key-stroke
Voice
Gesture
Hand-ling
Gait
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## Scenario 1

Legitimate employee attempts to log in to access corporate data from office in Southern California using work desktop at 9:00 a.m. PST

**Risk-based authentication analyzes:**

| User ID | Password | Device Fingerprint | Location | Geo-velocity | IP Address | Login History |
|---|---|---|---|---|---|---|
| **Traditional Pattern** | | | | | | |
| Valid | Valid | Corporate-issued computer, normally utilized by user | Location of company, from where user normally works | No distance traveled, accepted geo-velocity range | Valid | During normal working hours |

**PASS**

## Scenario 2

Legitimate employee attempts to log into corporate email in San Francisco on smartphone at 8:30 p.m. PST

**Risk-based authentication analyzes:**

| User ID | Password | Device Fingerprint | Location | Geo-velocity | IP Address | Login History |
|---|---|---|---|---|---|---|
| **Traditional Pattern** | | | | | | |
| Valid | Valid | Recognized device associated with user | Not normal location, but near enough geographically | Distance traveled appropriate for user's last login time | Valid | During abnormal working hours |

**PASS**

## Scenario 3

Attacker attempts to log in to access corporate data from the UK using a personal computer at 2:30 a.m. PST

**Risk-based authentication analyzes:**

| User ID | Password | Device Fingerprint | Location | Geo-velocity | IP Address | Login History |
|---|---|---|---|---|---|---|
| **Traditional Pattern** | | | | | | |
| Valid | Valid | Unknown device, no association to user | Abnormal Location and not near to standard location | Distance travel inappropriate for user's last login time | Valid | During very abnormal working hours |

**FAIL**

Source: StorageCraft

# IEEE 2410-2017 platform configuration options (ISO 24745)

| Storage | Matching | |
|---|---|---|
| | Mobile | Server |
| Mobile | ? (FIDO UAF, WebAuthN) | ? |
| Server | ? | ? |
| Shares (both mobile and server) | ? | ? |

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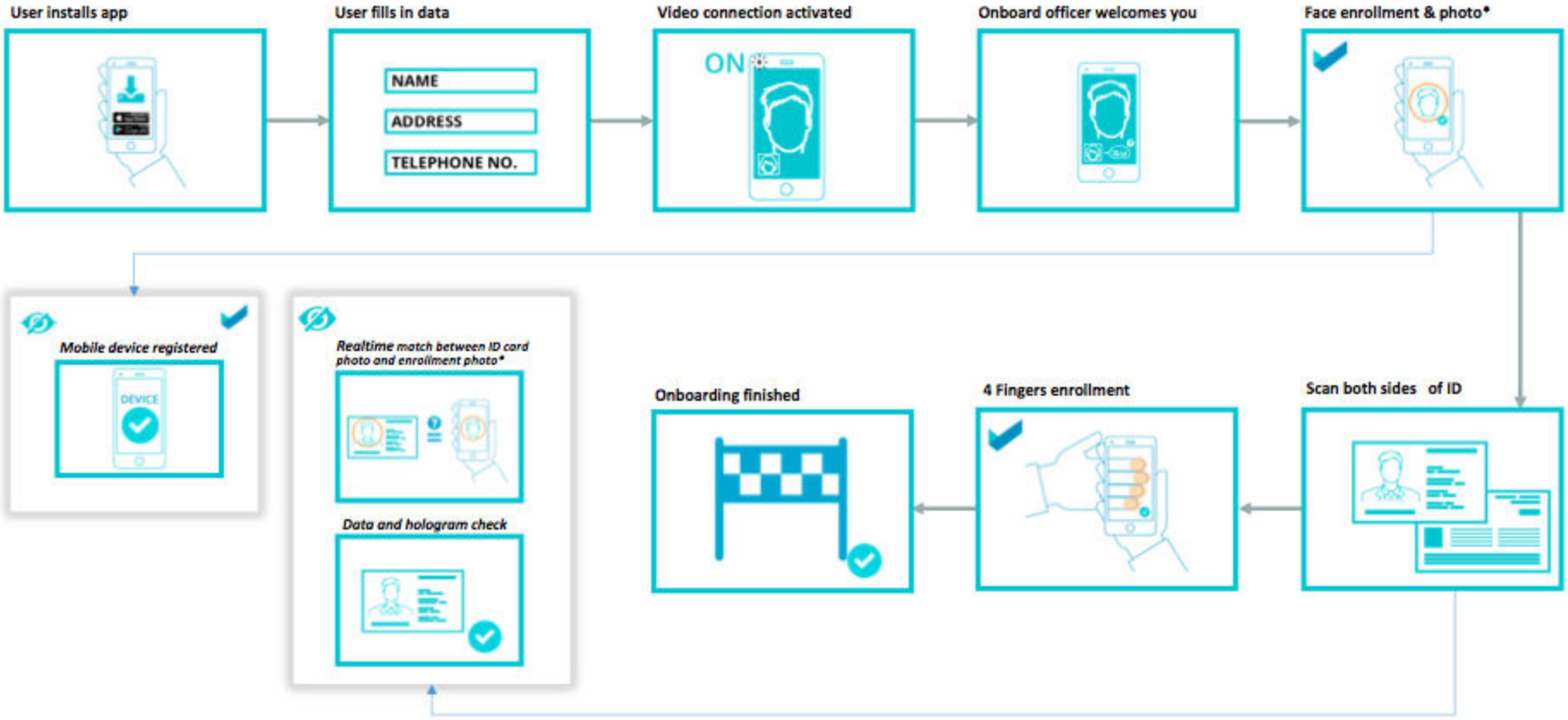
| Server | ? | ? |
| Shares (both mobile and server) | ? | ? |

# INITIAL ONBOARDING & ENROLLMENT



# Six Principles for Self-Sovereign Biometrics

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ABSTRACT

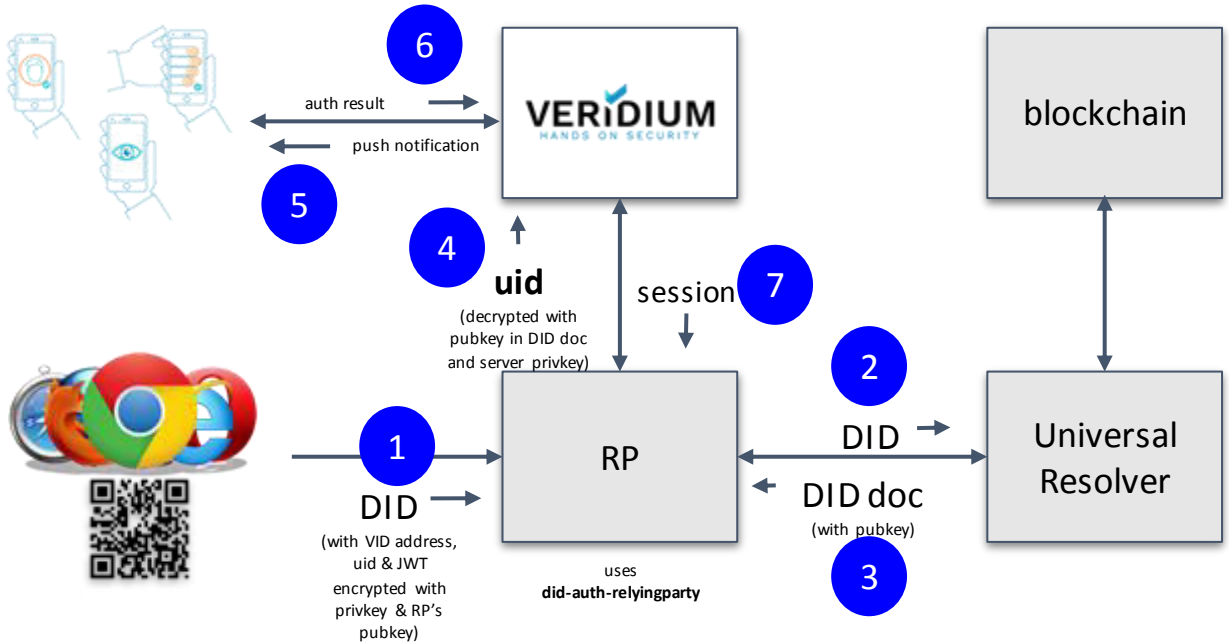
Biometrics are widely used for identity proofing, identity verification and authentication, but many implementations are vulnerable to breaches and exploitation. For example, centralized repo
biometric data, c
of privacy and c
blockchains that
This paper descr

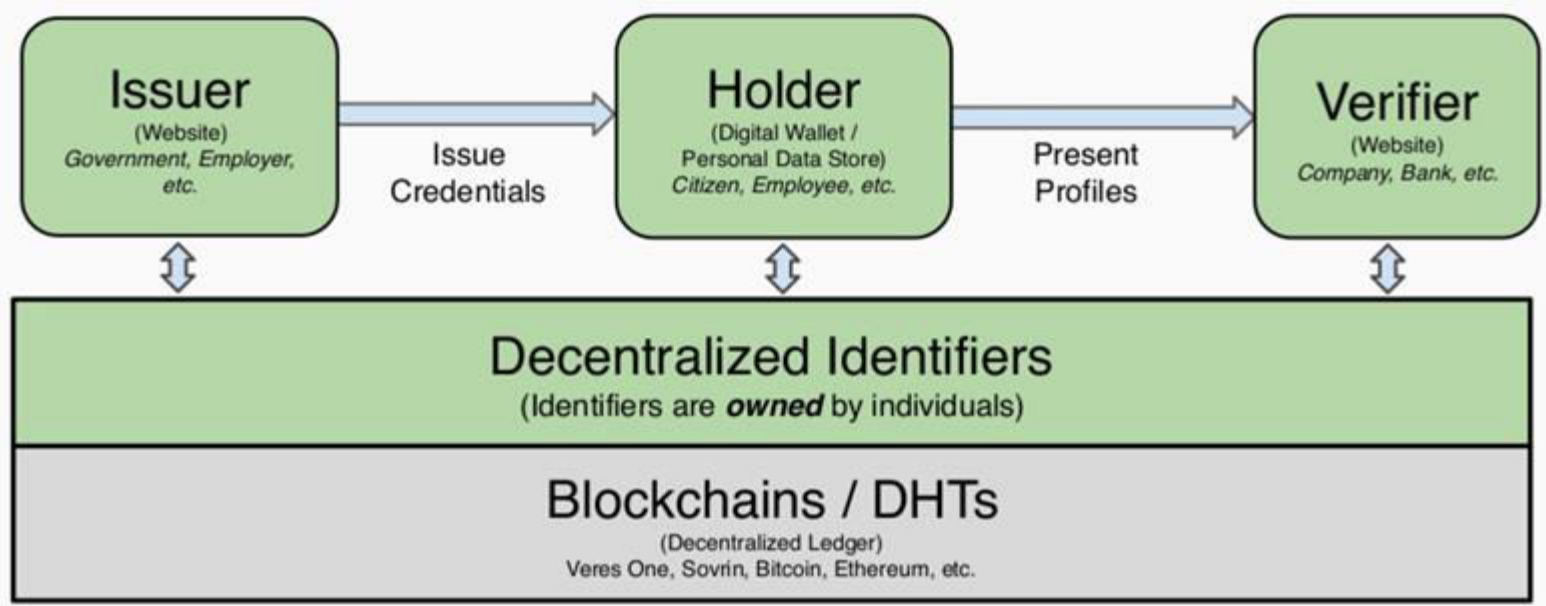
**Biometric DID Auth Flow A: mobile store and mobile match**

In this flow, the IBV is stored on the mobile device, typically with the assistance of a TPM, such as iOS Secure Enclave. This is a typical flow for hardware-specific biometrics, like TouchId and FaceID on iOS devices, where biometric data is never transmitted. This configuration is supported by IEEE 2410 and FIDO UAF. The mobile-mobile configuration corresponds to DID Architecture 1 and DID Architecture 2 ^19. In both architectures, the AuthN Materials (i.e., the private key) are protected by

1. **Biometrics Should Be Stored at the Edge**
2. **Biometrics Should Never Be Stored on a Blockchain**
3. **Biometrics Can Be Accessed *Via* a Blockchain**
4. **Biometrics Should Be Under A User's Control**
5. **Biometrics Traits Should Be Reliable**
6. **Biometrics Are Part of an Ecosystem**

# Biometric DID Authentication with IEEE 2410-2017



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