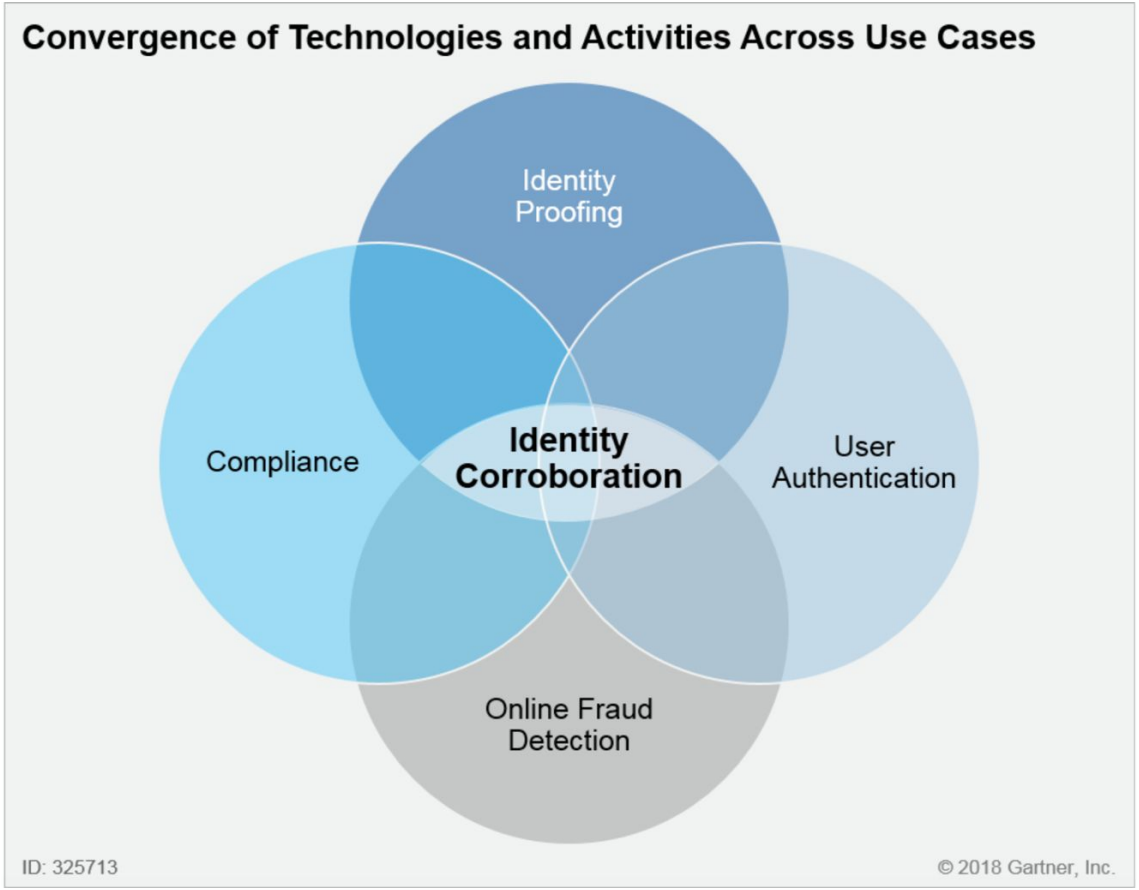
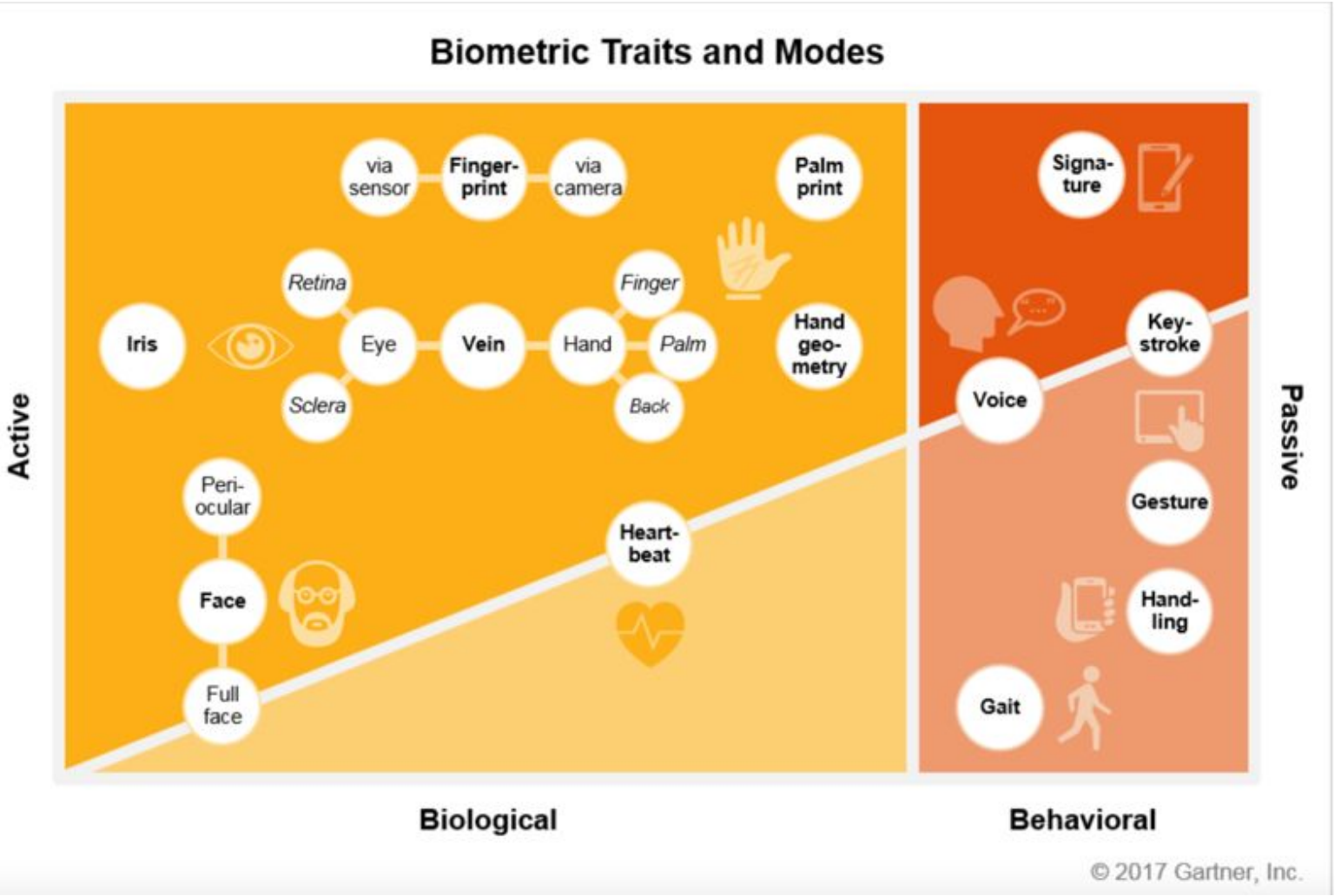
VERIDIUM
HANDS ON SECURITY

Authenticators

Convergence




Biometric Traits and Modes
Active
Passive
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
Biological
Behavioral
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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:

Traditional Pattern

User ID	Password	Device Fingerprint	Location	Geo-velocity	IP Address	Login History
✓ 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

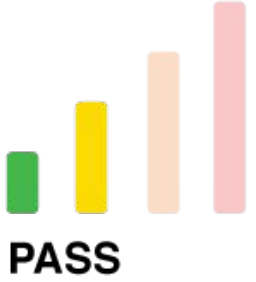
Scenario 2

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

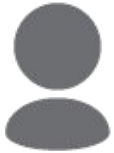
Risk-based authentication analyzes:

Traditional Pattern

User ID	Password	Device Fingerprint	Location	Geo-velocity	IP Address	Login History
✓ 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



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:

Traditional Pattern

User ID	Password	Device Fingerprint	Location	Geo-velocity	IP Address	Login History
✓ 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

Source: StorageCraft

IEEE 2410-2017 platform configuration options (ISO 24745)

Storage	Matching	
	Mobile	Server
Mobile	✓ (FIDO UAF, WebAuthN)	✓
Server	✓	✓
Shares (both mobile and server)	✓	✓

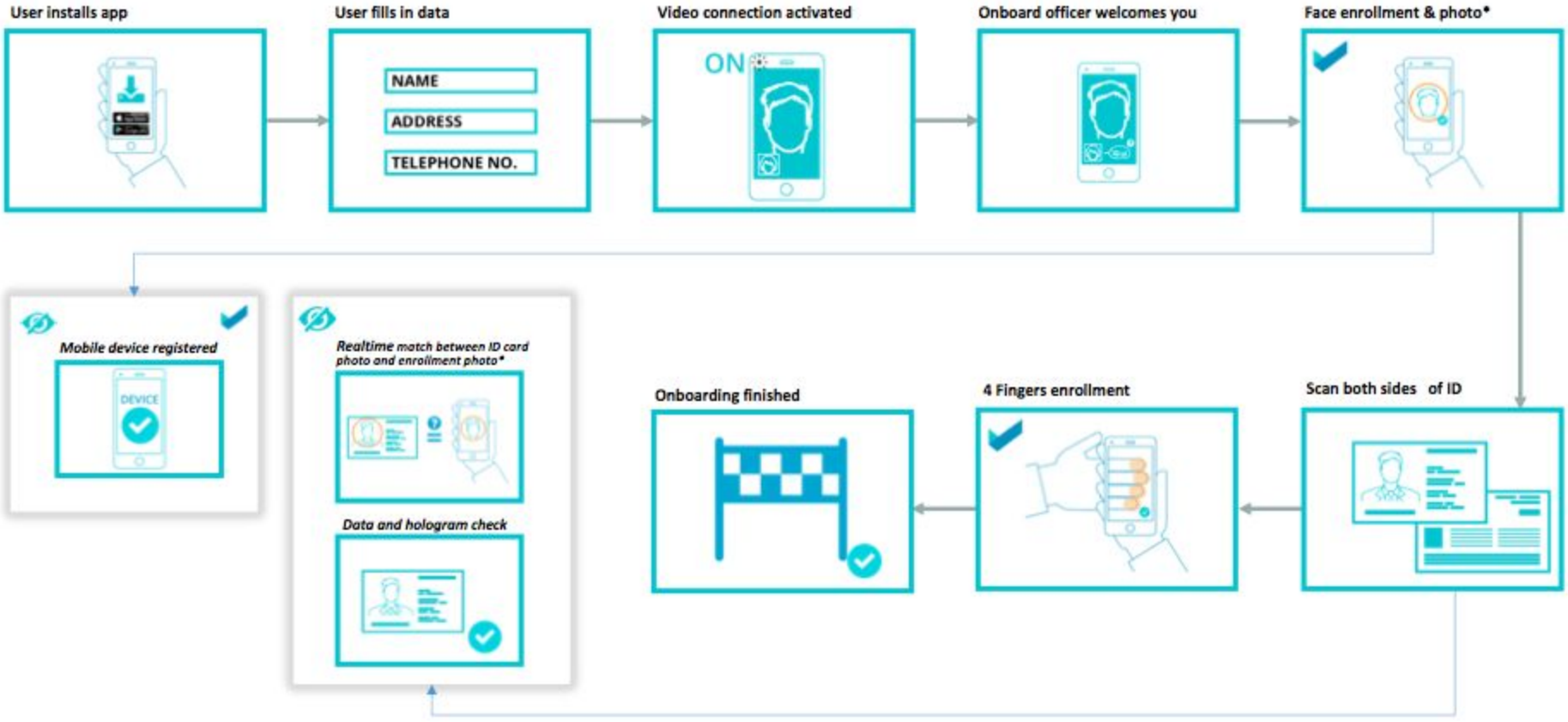
IEEE 2410-2017 platform configuration options (ISO 24745)

Storage	Matching	
	Mobile	Server
Mobile	✓ (FIDO UAF, WebAuthN)	✓
Server	✓	✓
Shares (both mobile and server)	✓	✓

IEEE 2410-2017 platform configuration options (ISO 24745)

Storage	Matching	
	Mobile	Server
Mobile	✓ (FIDO UAF, WebAuthN)	✓
Server	✓	✓
Shares (both mobile and server)	✓	✓

INITIAL ONBOARDING & ENROLLMENT



Six Principles for Self-Sovereign Biometrics

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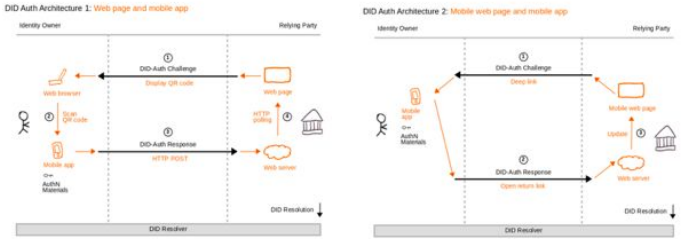
ABSTRACT

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

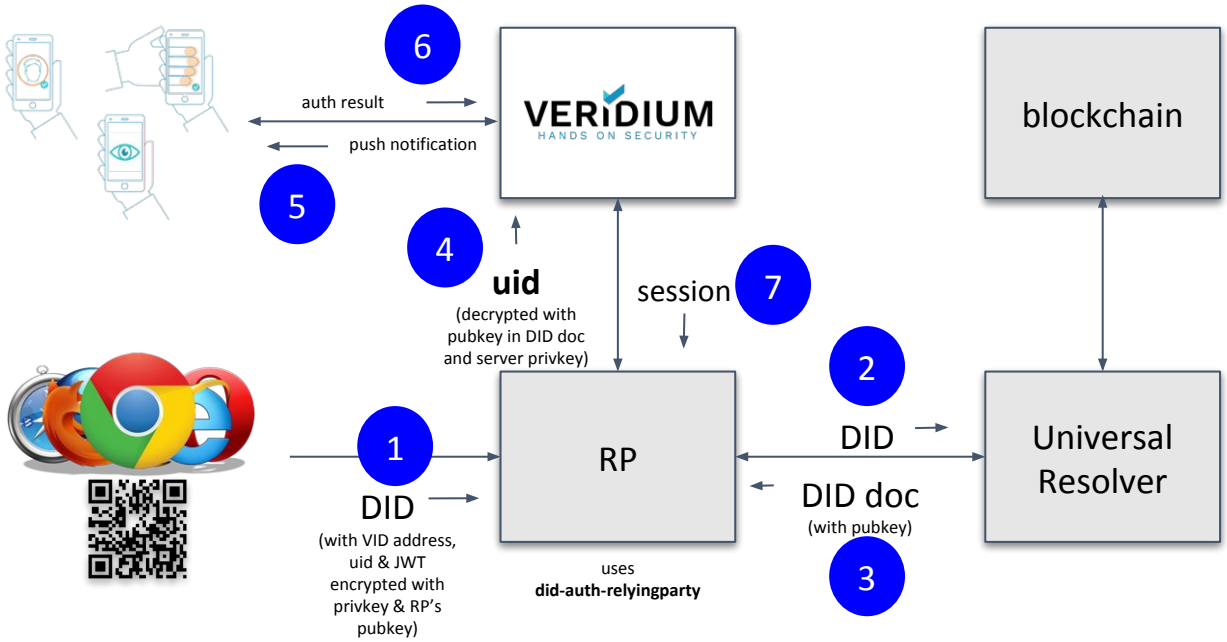
Biometric DID Auth Flow A: mobile store and mobile match

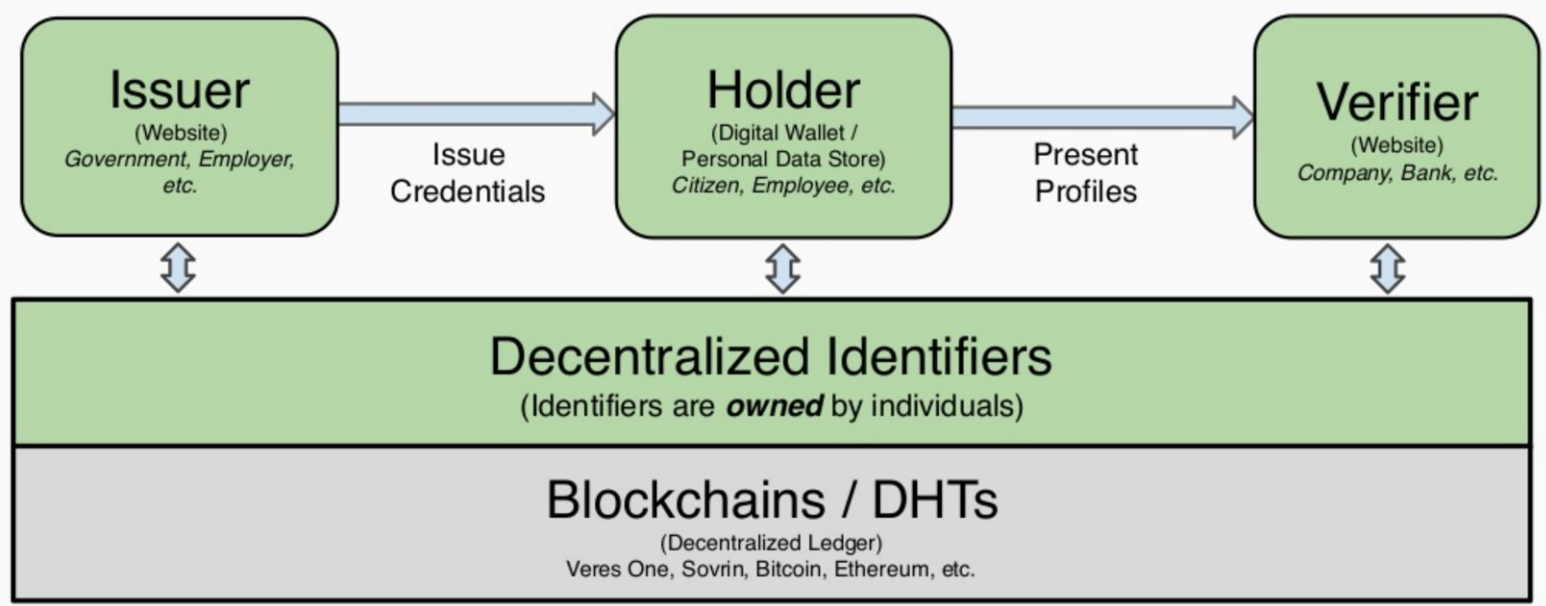
In this flow, the IBV is stored on the mobile device, typically with the assistance of a TPM, such as iOS Secure Enclave. This is a typical flow for hardware-specific biometrics, like TouchId and FaceID on iOS devices, where biometric data is never transmitted. This configuration is supported by IEEE 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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