Workload Identity Authentication Levels

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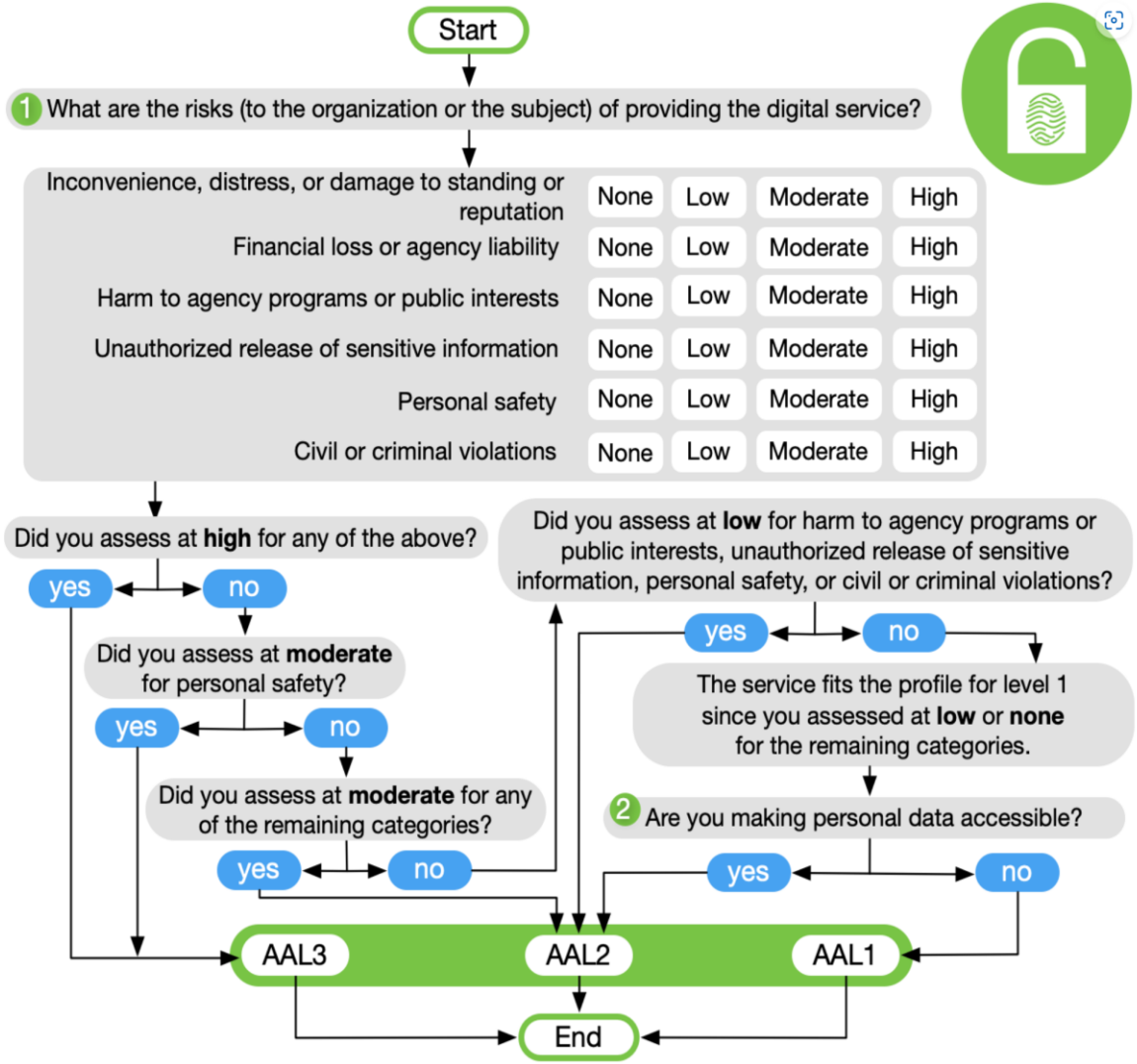
Why do we need workload authentication levels?

- All workloads authenticate…
  - .., but not all authentication is created equal
- There are frameworks for user authentication levels
  - Something you have, something you are, something you know
  - NIST Authentication Assurance Levels
- How they help
  - Establish a benchmarks and classification systems
  - Guide “expertise elsewhere” decision makers
  - Surfaces risk and allow for systemic and industry level mitigation

NIST 800-63-3 Authenticator Assurance Levels (AAL)

Authenticator Assurance Level
AAL1: AAL1 provides some assurance that the claimant controls an authenticator registered to the subscriber. AAL1 requires single-factor authentication using a wide range of available authentication technologies. Successful authentication requires that the claimant prove possession and control of the authenticator(s) through a secure authentication protocol.
AAL2: AAL2 provides high confidence that the claimant controls authenticator(s) registered to the subscriber. Proof of possession and control of two different authentication factors is required through a secure authentication protocol. Approved cryptographic techniques are required at AAL2 and above.
AAL3: AAL3 provides very high confidence that the claimant controls authenticator(s) registered to the subscriber. Authentication at AAL3 is based on proof of possession of a key through a cryptographic protocol. AAL3 is like AAL2 but also requires a “hard” cryptographic authenticator that provides verifier impersonation resistance.



What might that look like for Workloads

Level 0: No Authentication

•**Description**: No authentication mechanisms are in place.

Level 1: Deploy Time Shared-Secret Based Authentication

Description: Manual deploy time of simple passwords, shared secrets and API keys without lifecycle management

Level 2: Deploy-Time Credential Based Authentication

•**Description**: Static asymmetric key-based authentication and symmetric credential management systems that are deployed during setup.

Level 3: Automated Authentication with Static Credentials

•**Description**: Automated authentication using static credentials and improved logging.

Level 4: Dynamic Authentication with Renewable Credentials

•**Description**: Dynamic authentication using renewable credentials with moderate automation.

Level 5: Zero-Trust Principles with Context-Aware Authentication

Description: Implementation of zero-trust principles with context-aware authentication.

What Next?

- Is this needed?
- Is this something for the IETF or WIMSE?
- What criteria to consider?
  - Granularity – how many levels?
  - Additional Metadata – Runtime information for threat detection
  - Time Variance – How to allow for evolution over time
  - Adoption – Making it easy for “expertise elsewhere”