Automated Cryptographic Validation Protocol (ACVP)

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ACVP – About

- Web-based protocol for cryptographic algorithm testing
- Testing is done via Vector Sets that describe the individual tests a client should perform
- All requests are initiated by the client

ACVP – Testing

1. Client sends *registration* to server.

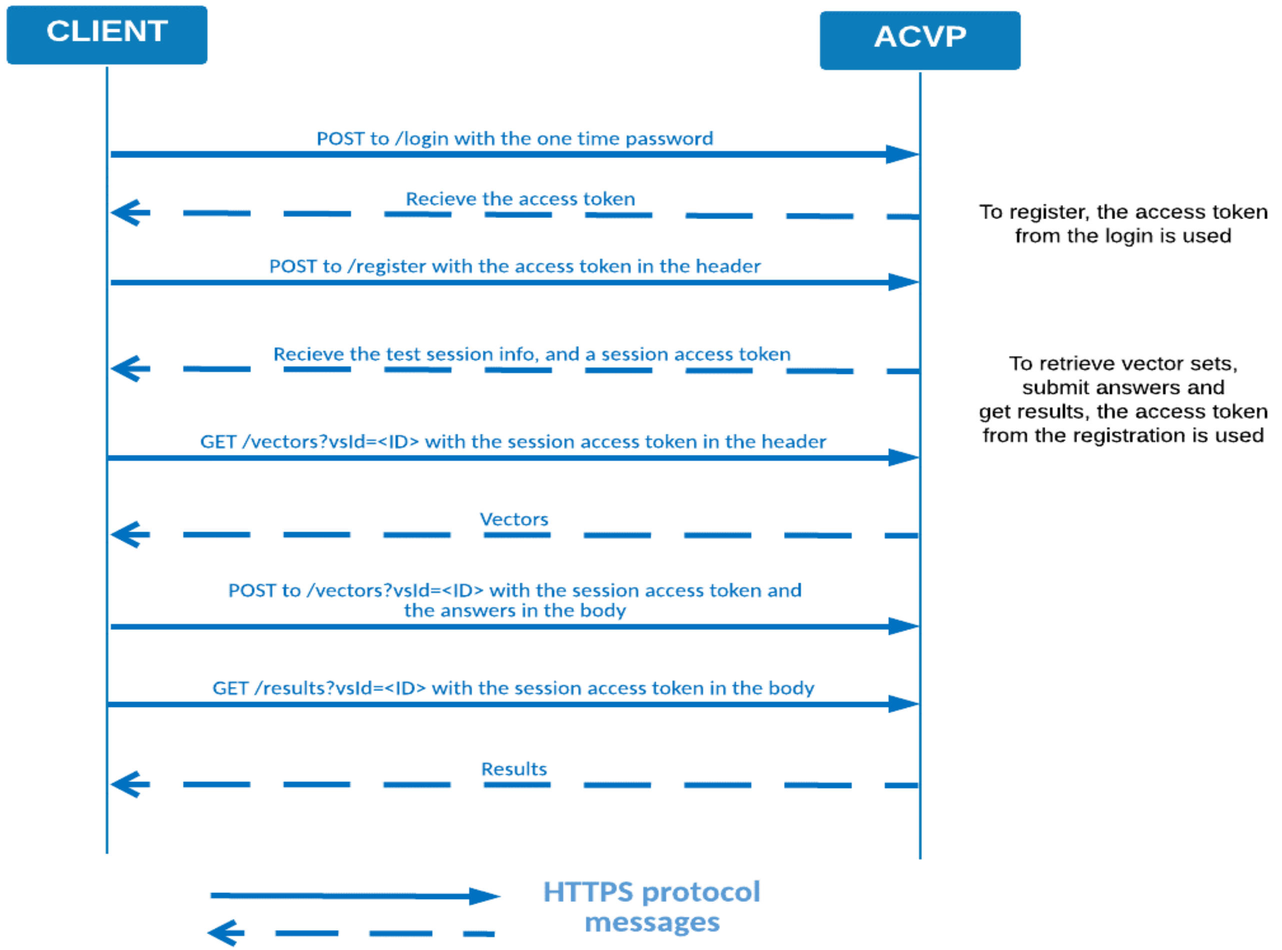
Describes module capabilities.

2. Server creates a vector set *prompt* for each algorithm listed in the capabilities.

3. Client retrieves any prompt, processes and submits *responses* to server.

4. Server lists the *disposition* for retrieval. Once the full Test Session is done, the client may Certify.

ACVP – Metadata


CLIENT
ACVP
POST to /login with the one time password
Recieve the access token
POST to /register with the access token in the header
Recieve the test session info, and a session access token
GET /vectors?vsId=<ID> with the session access token in the header
Vectors
POST to /vectors?vsId=<ID> with the session access token and the answers in the body
GET /results?vsId=<ID> with the session access token in the body
Results
HTTPS protocol messages

To register, the access token from the login is used

To retrieve vector sets, submit answers and get results, the access token from the registration is used

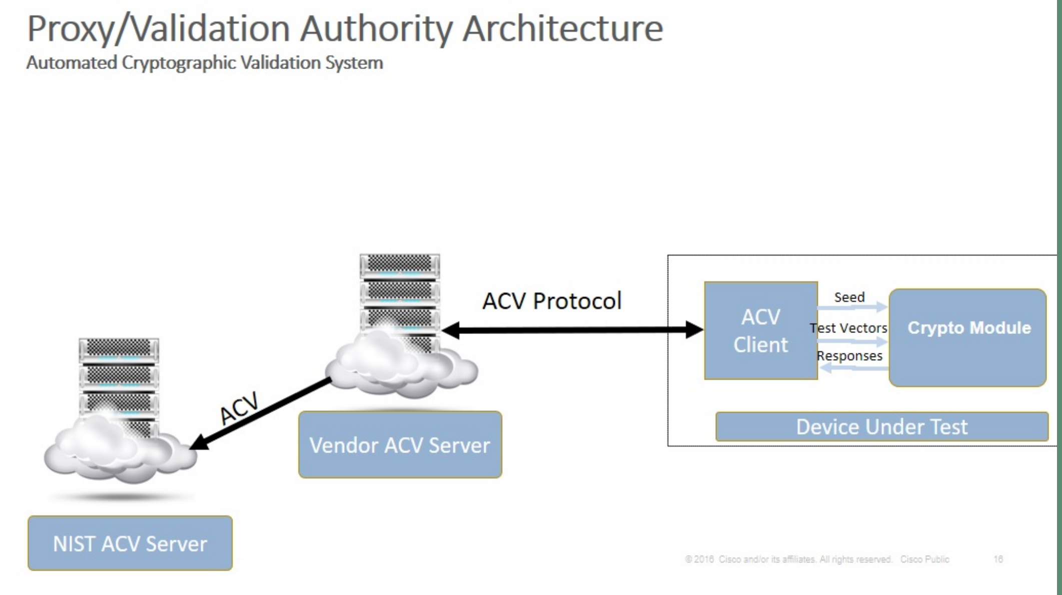
1. Metadata objects are created through the API, separate from the testing being performed.

2. An *implementation* has a *vendor/organization* and a *person* responsible for the validation.

3. An *operating environment* describes the platform the module was tested on: CPU, OS, etc.

4. A **Certify** combines a Test Session with an *implementation* and an *OE.*

ACVP – Status



Proxy/Validation Authority Architecture

Automated Cryptographic Validation System

- Exceeded capabilities of CAVS tool
- High throughput of validations
  - Most within a few minutes end to end
- Centralized model is easy to build upon
- Demo server for testing
- Prod server for validations

ACVP – Current Goals

1 Remove Vendor Assertion

- Provide testing for all approved algorithms and modes
- Expand capabilities to accommodate for special cases

2 Upgrade Testing

- Address known vulnerabilities through testing
- Explore formal methods

3 "Query"-able Validations

- Allow queries against CSRC to obtain validation records in JSON for upstream use

4 Support Upcoming Algorithms

- Post-Quantum
- Lightweight
- Hash-based signatures

ACVP – Get Involved

GitHub

https://www.github.com/usnistgov/acvp

https://www.github.com/usnistgov/acvp-server

Research

https://www.nist.gov/publications/extending-nists-cavp-testing-cryptographic-hash-function-implementations

Clients

https://github.com/cisco/libacvp

https://github.com/smuellerDD/acvpproxy

https://github.com/smuellerDD/acvpparser

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