# Status of SciTokens AuthZ Plugin

Derek Weitzel

# SciTokens

- SciTokens are special JSON Web Tokens(JWT, RFC 7519)
- JWT defines the structure and the cryptography
- SciTokens adds attributes and defines a “scope” language

# demo.scitokens.org

## Decoded EDIT THE PAYLOAD

HEADER: ALGORITHM & TOKEN TYPE

```
{
  "typ": "JWT",
  "alg": "RS256"
}
```

PAYLOAD: DATA

```
{
  "scp": "read:/protected",
  "aud": "https://demo.scitokens.org",
  "iss": "https://demo.scitokens.org",
  "exp": 1528138839,
  "iat": 1528138239,
  "nbf": 1528138239,
  "jti": "a15f01c5-6bdf-4cc3-bb6f-dc6375488471"
}
```

## Encoded


```
eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiJ9.eyJzY3
AiOiJyZWFkOi9wcm90ZWN0ZWQiLCJhdWQiOiJodHRwc
zovL2RlbW8uc2NpdG9rZW5zLm9yZyIsImlzcyI6Imh0
dHBzOi8vZGVtby5zY2l0b2tlbnMub3JnIiwiZXhwIjo
xNTI4MTM4ODQwLCJpYXQiOjE1MjgxMzgyNDAsIm5iZi
I6MTUyODEzODI0MCwianRpIjoiYTE1ZjAxYzUtNmJkZ
i00Y2MzLWJiNmYtZGM2Mzc1NDg4NDcxIn0.PnVIoM0V
2nn-
vu84zEkyk0ka6YsDIrkeGRO4elyKvI9HeFXUfAu1pNY
TorlAsybht7avjLb3RLPmWggKs2Z5knz_oeWuyXffdY
pwYWDA49ck9IUNT-
Jcs7UrE4mBjimyCez3HU9bW56ZDseBYPoOcXR-
3lRfRghTv0n9Sp06LIVwm39SFYQIth7i8jnkzoIT2zd
```

# SciTokens

- SciTokens has already be integrated with many services:
- **XRootD**
- NGINX (through a configuration)
- Even a Heroku Application (Flask)

# List of tasks

1. Modifications to CVMFS
   https://github.com/cvmfs/cvmfs/pull/1980

2. Integration Tests - Mostly copy from secure CVMFS

3. SciTokens Plugin - Python plugin

# Changes to CVMFS

- New type of Auth type, Bearer Tokens
- A bearer token is an opaque string sent to the web server

```
> GET /protected HTTP/1.1
> Host: demo.scitokens.org
> User-Agent: curl/7.52.1
> Accept: */*
> Authorization: Bearer eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiJ9.eyJzY3AiOiJy…
```

- Doesn’t **need** to be a SciToken, though I will be writing the plugin specific to SciTokens

# Differences from X.509

- Auth is handled outside of the transport layer!
- No need to setup special SSL settings to include the client proxy / cert
- Much smaller changes to CVMFS

# Integration Tests

- The integration test needs to setup a HTTP web server and authenticate SciToken

- Will copy a lot from the secure-CVMFS, since it does most of this

- Timeline: 1-2 weeks

# SciTokens Plugin

- SciTokens library is in Python.  Already have an “always allow” for testing: https://github.com/scitokens/cvmfs-scitokens-helper
- We will chain auth plugins:
    1. Try SciTokens
    2. Then, try X.509

# Plugin Chaining

- Difficult part: Maintaining a process, the x509 plugin
    - Do not want to restart the process often due to reading in globus libraries…

- If SciTokens authz, simply proxy the connection to the x509 plugin

# Summary

1. Modifications to CVMFS
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2. Integration Tests - Mostly copy from secure CVMFS

3. SciTokens Plugin - Python plugin