A New Authorization System for IceCube Applications

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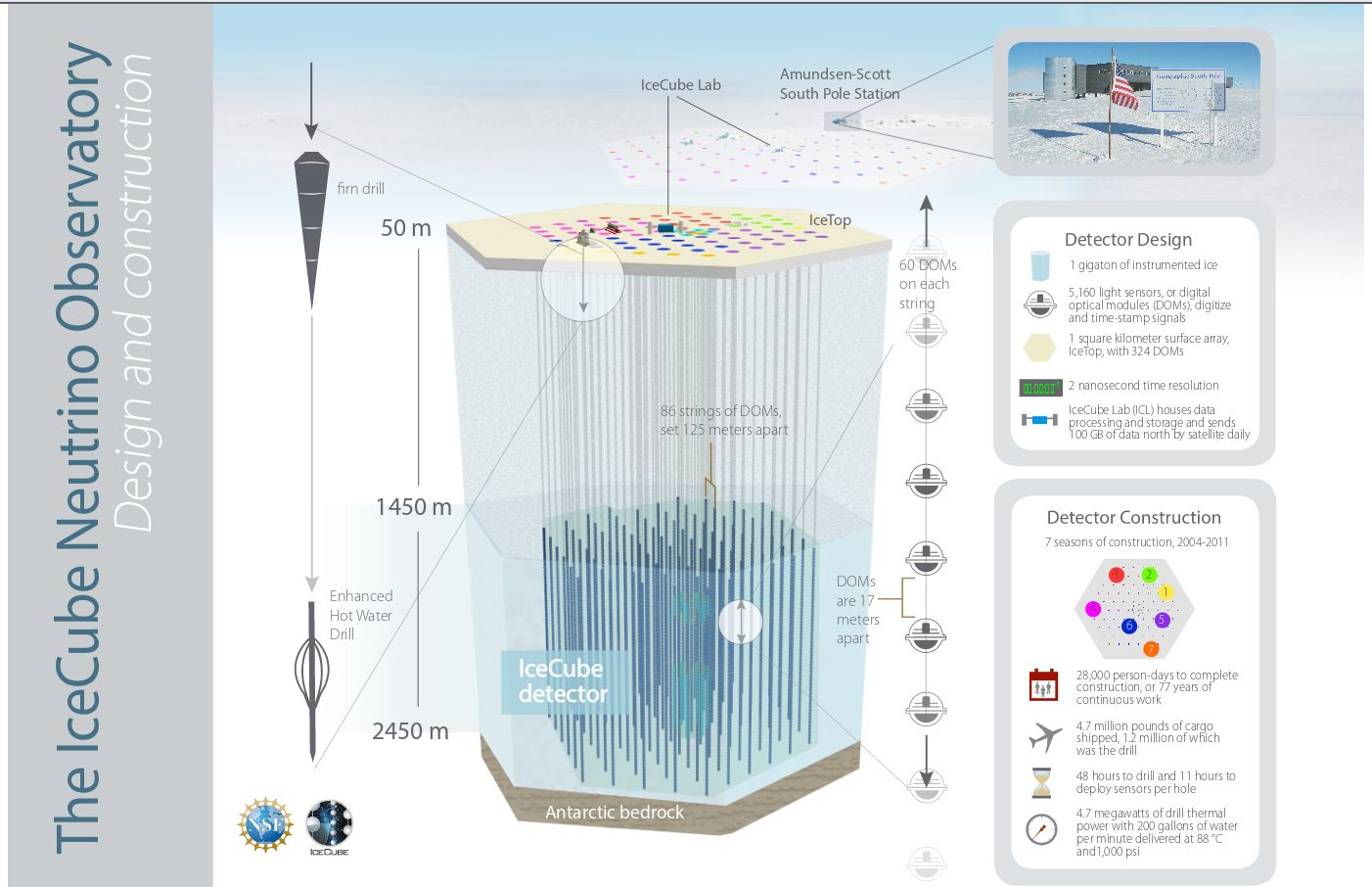
Outline

- What is IceCube
- Authentication and Authorization
  - Previous hodgepodge and new system
- Rollout Status

IceCube Collaboration

IceCube Neutrino Observatory



Authentication - Previous

Primary auth is LDAP at UW-Madison

- Used for ssh, some web pages

Secondary auth is x509

- Accessing storage servers via gridftp

Several more auths on an ad-hoc basis

- Primarily web applications

Authentication - New / Future

Use OAuth2

- Web sites / applications
- Storage
- …

Currently a wrapper on top of LDAP

- Potential transition to Google as Identity Provider

Authorization - Previous

For most web sites, all or none

- If you can authenticate, you have access

Some web applications have local groups

- Difficult to manage

Storage based primarily on local mapping

- Except in DESY, which has VOMS

Authorization - New / Future

Tokens with granted scopes

- Central authority / signing
- Uses public/private keys

Compliant with SciToken syntax

- JSON web token

Authorization - New / Future

Each service registers a scope handler

- Handler is given user info from OAuth2 IDP
- Can return Yes/No, or a more detailed scope string

Example:

- Requested scope “myapp”
  - Yes result gives token with scope “myapp”
  - No result fails the token request
  - String result “foo” gives token with scope “myapp:foo”

Authorization - New / Future

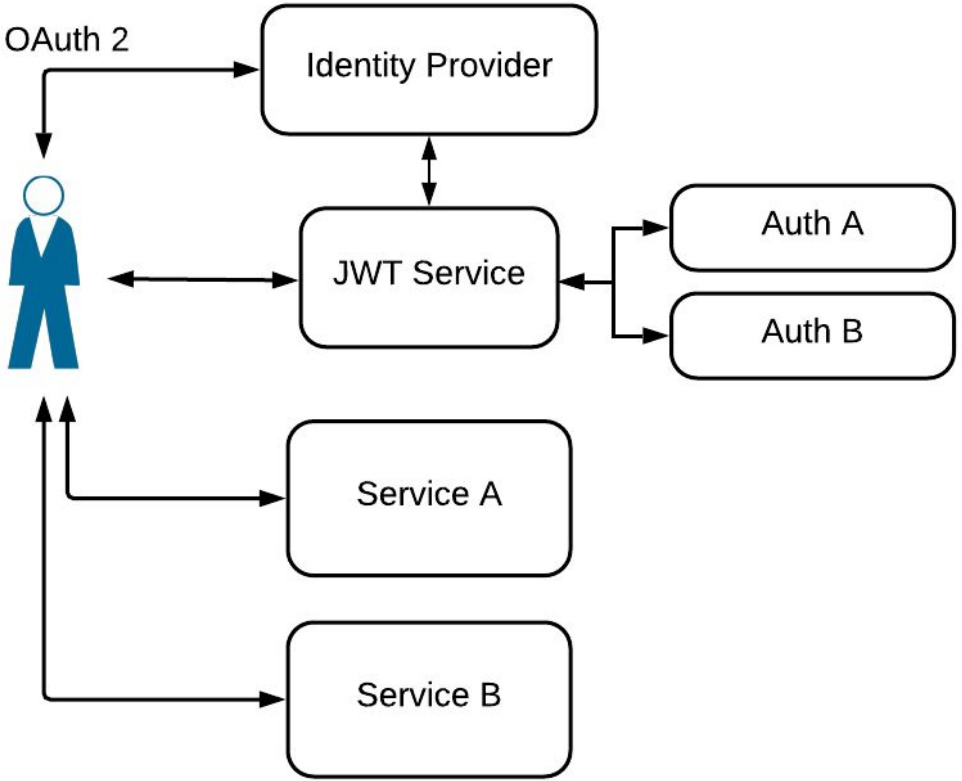
Each service registers a scope handler

- Handler is given user info from OAuth2
- Can return Yes/No, or a more detailed scope string

This matches with SciTokens for storage

- Requested scope “write:/users”
  - Normal users get their username appended: “write:/users/dschultz”

Authorization - New / Future



Authorization - New / Future

Revocation

- Tokens have short expiration, so most services rely on that
  - Configurable, but usually 20-60 minutes
- Not good enough for some services (at least I was told this)

So like any good developer, I programmed a solution

- Token service now registers each token that is created
- User can access their token list, and revoke them
  (admin can revoke any)
- Services can download new revocation list as needed
  (every 1 minute, maybe?)

Current status

- OAuth2 wrapper for LDAP since early 2019
- Token service running since March
- Several developer services transitioned this summer
  - Prometheus configuration, S3 presigned urls, file catalog
- Works well in production
  - Testing container specifically for dev / CI

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All running in Kubernetes

Current status

- Storage at Madison will support tokens by the end of 2019
- Simulation production infrastructure will then switch
- Analysis jobs should follow rapidly (not too many users)
  - At this point, X509 should only exist for DESY gridftp
  - Need to talk more with them
- Other web applications to switch in mid 2020

By the end of 2020, the transition should be complete

Conclusions

- IceCube had a proliferation of different authorization and authentication methods
- These are now consolidated going forward
- Tokens now in use at IceCube