Distributed OAuth

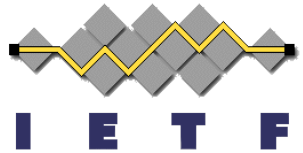
draft-hardt-distributed-oauth

Dick Hardt

IETF 100, Singapore

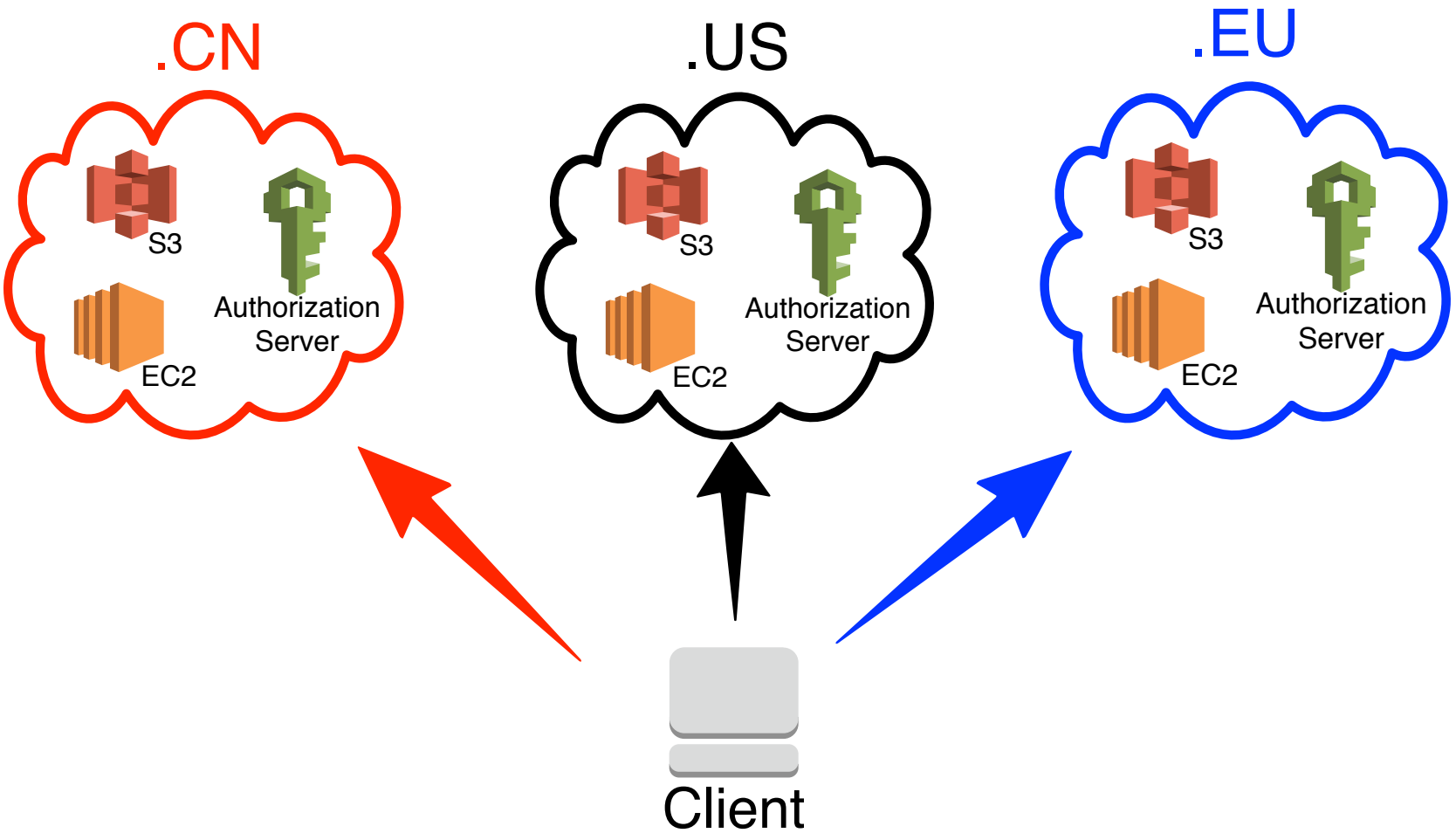
November 2017

Problem



- OAuth 2 presumes **static relationship** between authorization server and protected resource that is **known a priori** by client
- Global systems have similar protected resources, that are managed by different authorization servers. Eg. Different geopolitical regions.
- Large, distributed systems need to evolve the relationship between authorization servers and protected resources.
- Clients need to **dynamically** learn the authorization server for a given protected resource **at run time**.

Client Accessing Global Protected Resources



Proposed Solution

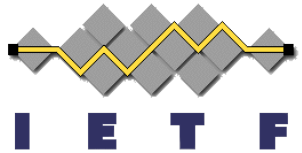
- Client discovers authorization server from protected resource in HTTP 401 response

```
HTTP/1.1 401 Unauthorized WWW-Authenticate: Bearer
    realm="example_realm",
    iss="http://issuer.example.com/token",
    scope="example_scope", error="invalid_token"
```

Threats

1. Access Token Reuse
   - Resource server uses access token at other protected resources
2. Resource Server Impersonation
   - Resource server provides meta data needed for different resource server
3. Malicious Authorization Server
   - Authorization server may replay client credentials at different authorization server

Mitigation
Access Token Reuse

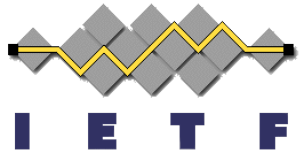


- Protected Resource specific access token
  - Client provides “host” parameter in access token request that matches protected resource host in TLS certificate
  - Authorization server includes “host” parameter in access token
  - Protected Resource verifies “host” parameter in access token
- Requires an access token for each PR

Alternative Mitigation Access Token Reuse

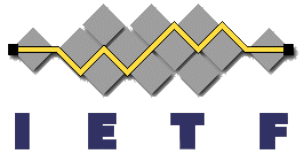
- Client Authentication
  - Client authenticates in call to Protected Resource
  - Protected Resource verifies client is “sub” in access token
- Requires PR to verify identity of Client

Mitigation
Resource Server Impersonation



- Same as Access Token Reuse

Mitigation
Malicious AS



- Client MUST use proof of possession mechanism to authenticate to authorization server (AS) that is resistant to man-in-the-middle attacks
- eg. Mutual TLS profile for OAuth

Next Steps

- OAuth WG interest?