Managing authorization grants beyond OAuth 2.0

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What this paper is about

- Review pros and cons of OAuth2

- Why we’re working on GNAP
  - IETF GNAP Grant Negotiation and Authorization Protocol
    - You’re welcome to participate
      - Join the mailing list https://datatracker.ietf.org/wg/gnap/documents/
      - Participate in issues https://github.com/ietf-wg-gnap/gnap-core-protocol

A primer

- Terminology : https://github.com/ietf-wg-gnap/gnap-core-protocol/wiki/Terminology

Resource Server (RS) = where there are protected resources, that require authorization to allow access (under the form of an access token)

Resource Owner (RO) = who owns the resource

End-user = who requires access through a client

In many cases: RO = end-user (ex: access to my banking account through a mobile app)

But not always: RO (patient) != end-user (doctor)

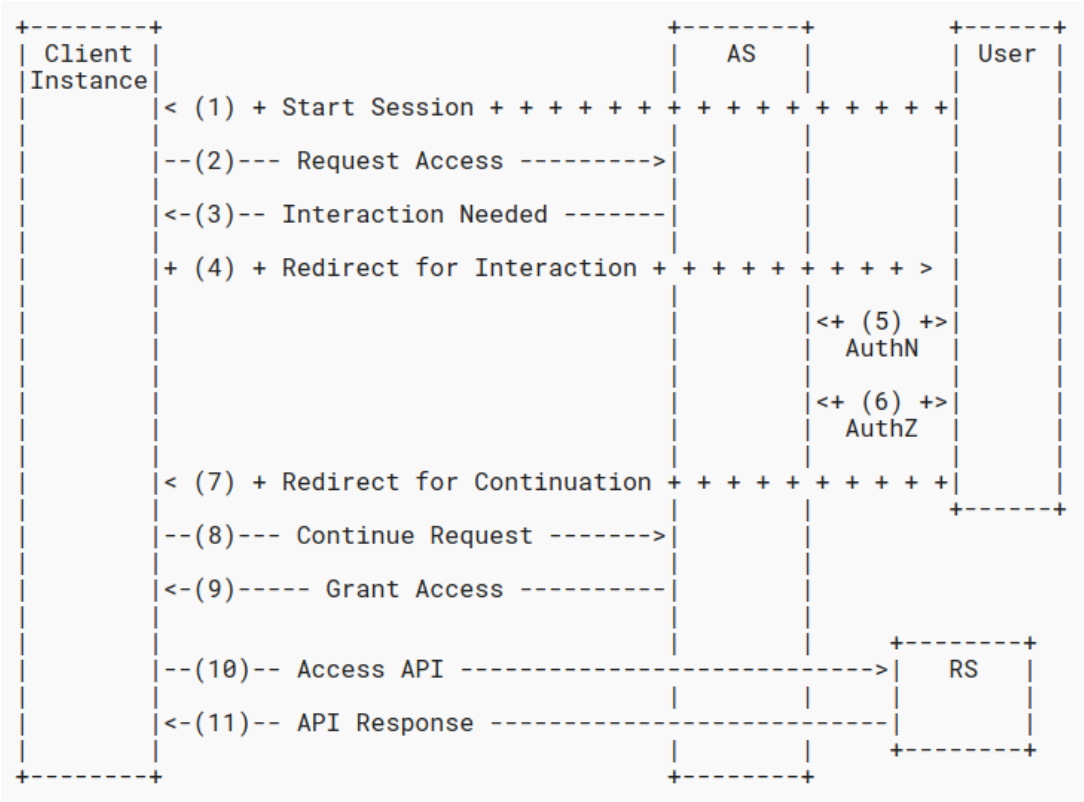
Beyond the web browser

- Web browser is only one interaction method amongst other

```
"interact": {
    "start": ["redirect", “"user_code", “app”],
    "finish": {
        "method": "redirect",
        "uri": "https://client.example.net/return/123455",
        "nonce": "LKLTI25DK82FX4T4QFZC"
    }
    }
```

Negotiation

- Interact / Continue API



Client instance

- Instead of registered client ID


```
"client": {
   "key": {
      "proof": "httpsig",
      "jwk": { ...  },
      "cert": "MIIEHDCCAwSgAwIBAgIBATANBgkqhkiG9w0BAQsFA..."
   },
   "class_id": "web-server-1234",
   "display": { "name": "My Client Display Name", "uri": "https://example.net/client"
   }
   }
```

Subject identifier

- Support for various identifier formats (opaque, DID, etc.) and assertions (idtoken, saml2)

https://datatracker.ietf.org/doc/draft-ietf-secevent-subject-identifiers/

```
"subject": {
  "sub_ids": [ {
    "format": "opaque",
    "id": "J2G8G8O4AZ"
  } ],
  "assertions": {
    "id_token": "eyj..."
  }
}
```

- GNAP aims direct support of OIDC but also SSI (cf “AS as a token” model)

Expanded delegation

- Richer request (aligned with RAR), support ACLs and capabilities

```
"access": [
   {
      "type": "photo-api",
      "actions": [ "read", "write", "delete"],
      "locations": [ "https://server.example.net/", "https://resource.local/other"],
      "datatypes": [ "metadata", "images"],
      "privileges": [ "admin"],
   }
   ]
```

Security

- Prove possession of key / rotate keys
- Various mechanisms, such as JWS, mTLS, httpsig

https://datatracker.ietf.org/doc/draft-ietf-httpbis-message-signatures/

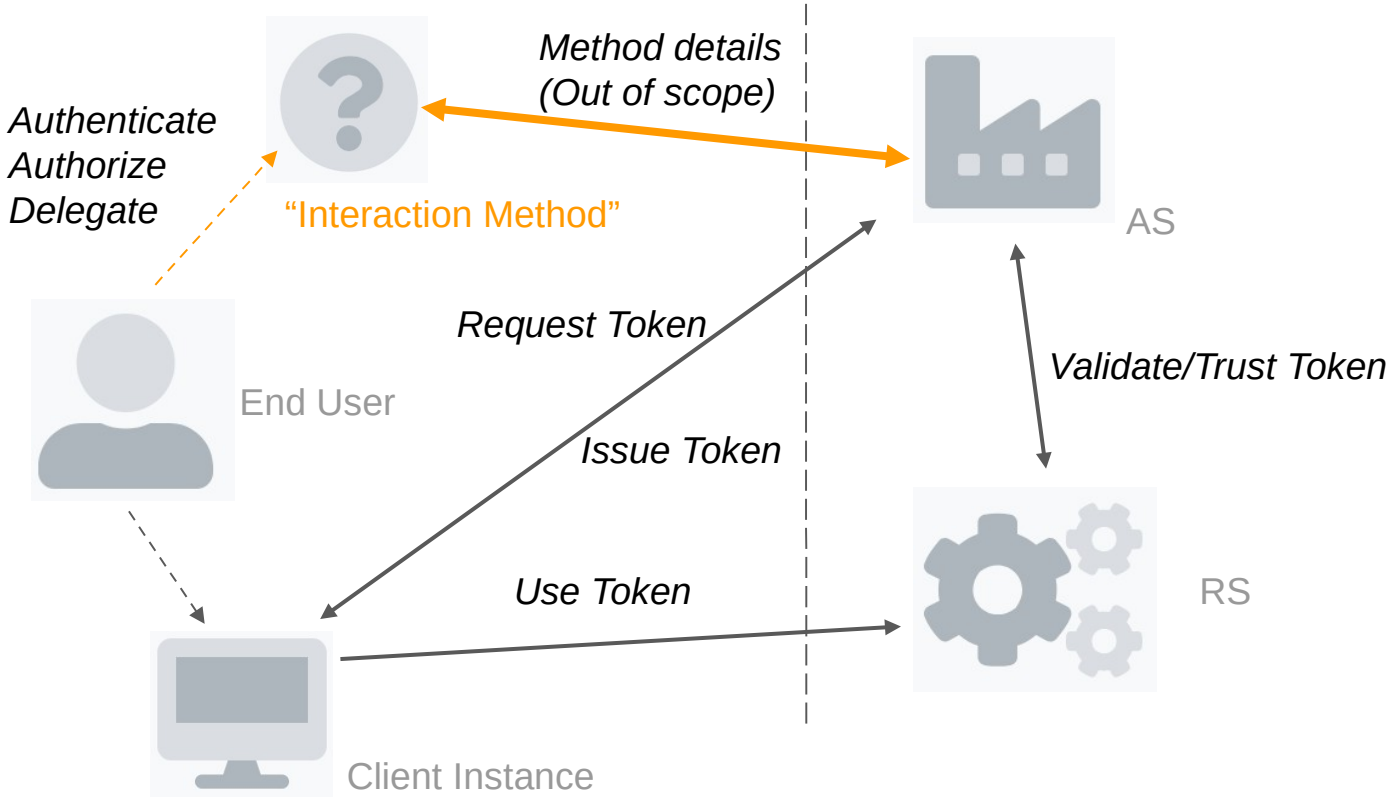
- Contributions on threats and security considerations welcome!

Privacy

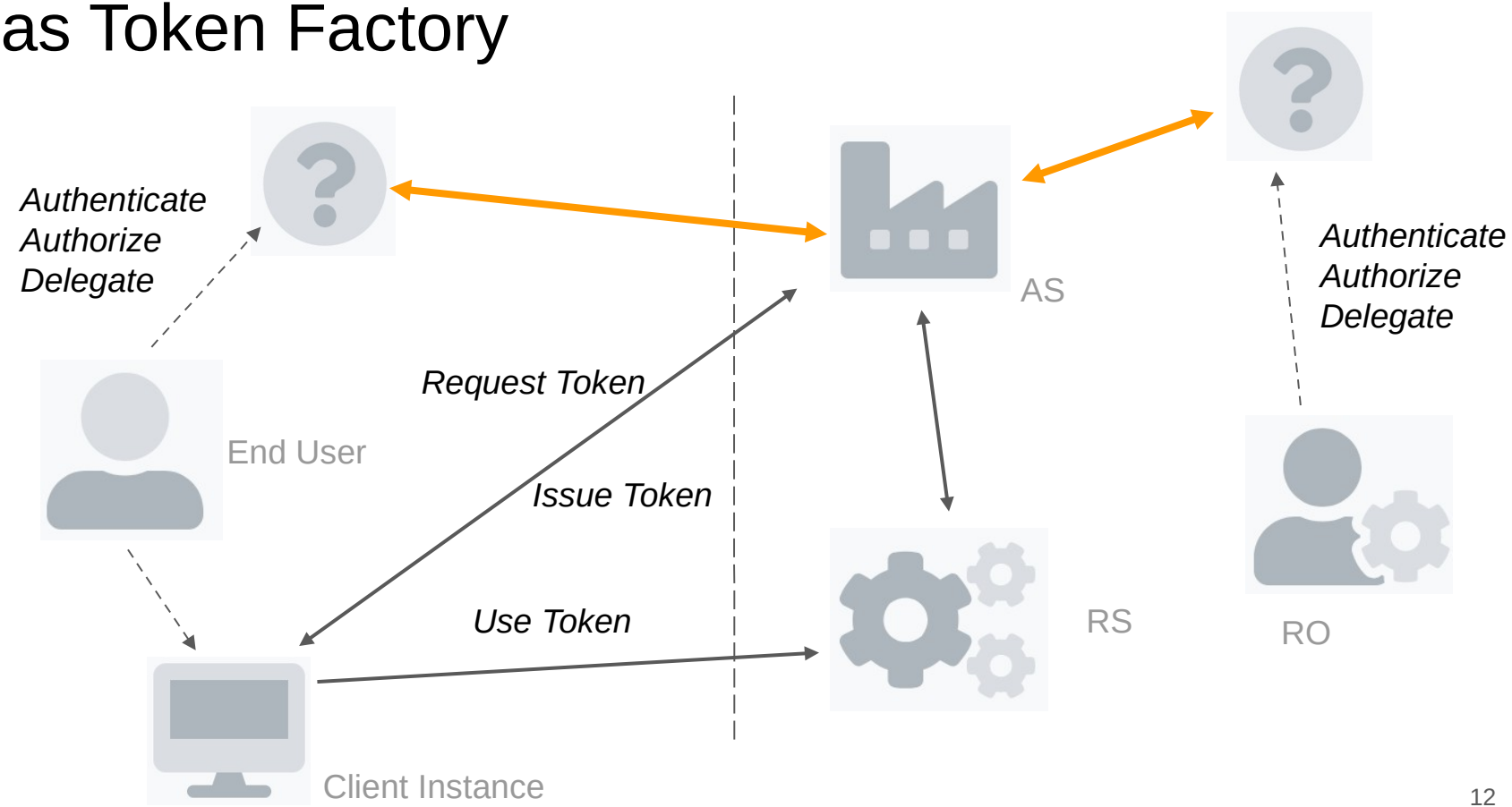
- GNAP tries to limit the odds of a consolidation to just a handful of super-popular AS services

- Additional spec to deal with AS-RS relationships
  - https://github.com/ietf-wg-gnap/gnap-resource-servers
  - Ex: delegation tokens

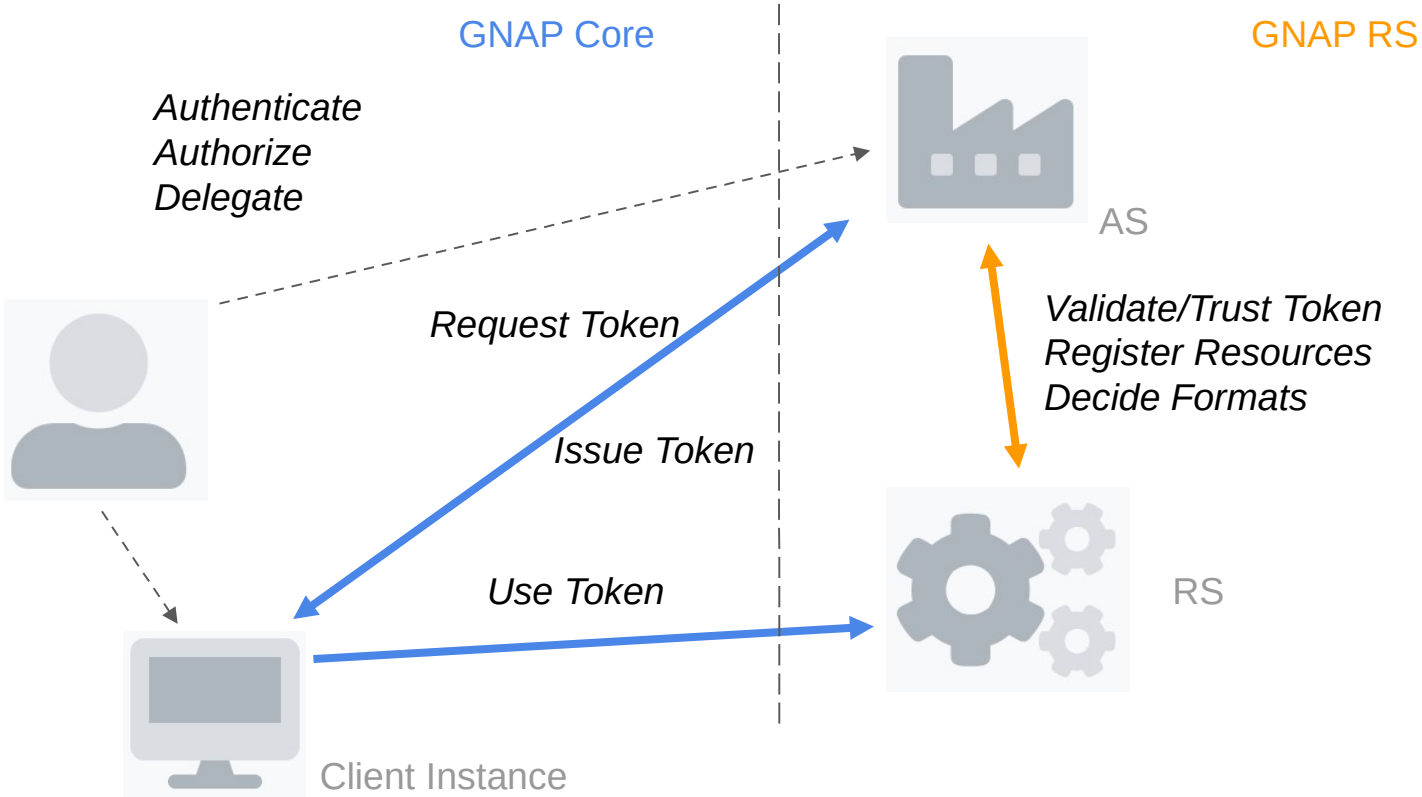
AS as Token Factory



AS as Token Factory



AS and RS Relationship



Additional resources

- Spec (draft-05): https://www.ietf.org/archive/id/draft-ietf-gnap-core-protocol-05.html

- There is a longer version of the paper at https://blog.fimbault.com/managing-authorization-grants-beyond-oauth-2

- Things you can’t do well in OAuth2
  - We cover some examples that would be impossible to do in OAuth2 / UMA2 (medical team)
  - Through a NGI_TRUST grant, we also extended GNAP to cover IoT scenarios https://blog.fimbault.com/lessons-learned-from-our-mediam-project